DOCUMENT RESUME

ED 436 540 TM 028 165

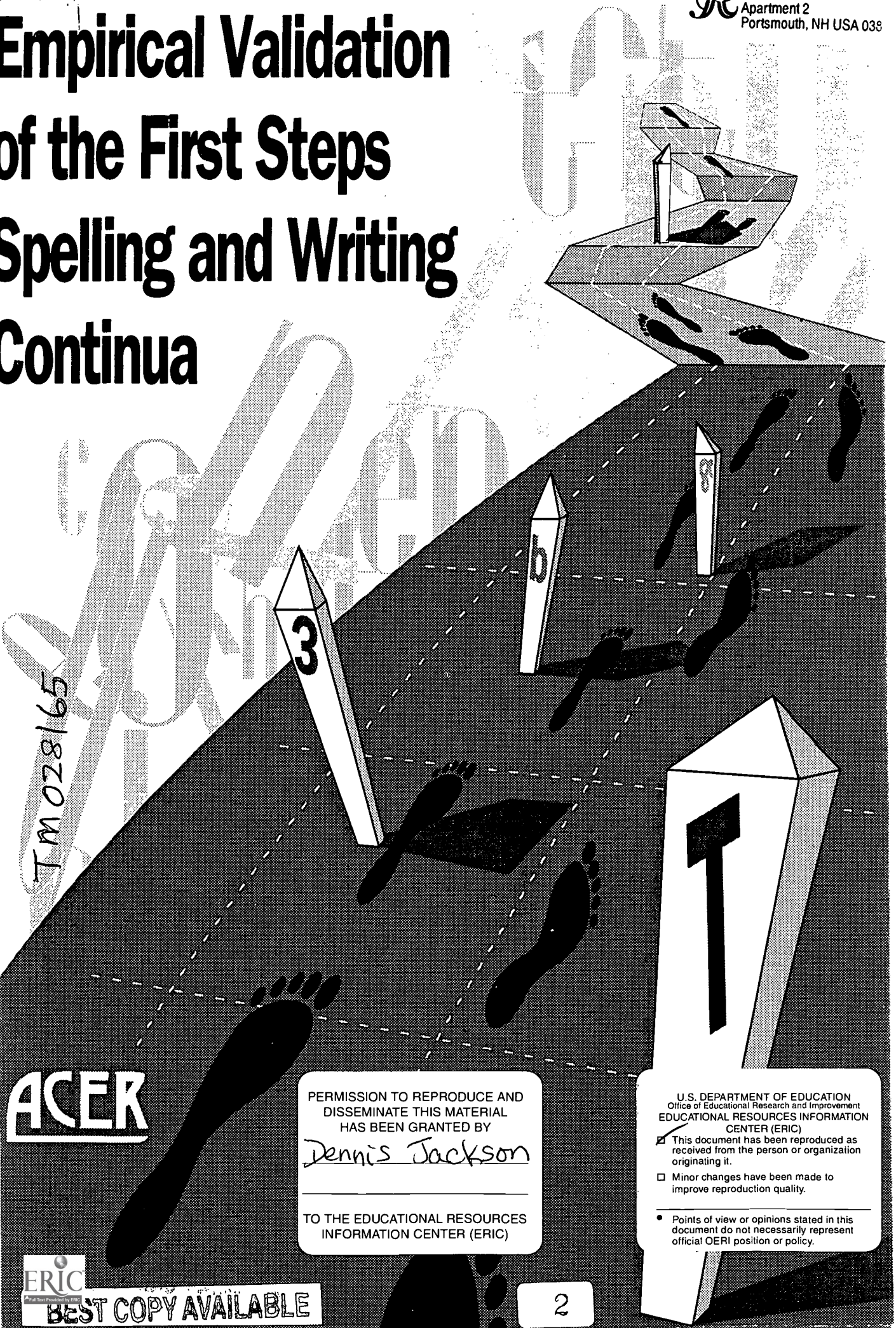
TITLE	Empirical Validation of the First Steps Spelling and Writing Continua.
INSTITUTION	Australian Council for Educational Research, Victoria.
SPONS AGENCY	Western Australia Ministry of Education, Perth. Curriculum Development Branch.
PUB DATE	1993-03-00
NOTE	88p.; For related "First Steps" documents, see TM 028 166-170 and TM 028 176.
PUB TYPE	Reports - Evaluative (142)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Child Development; *Developmental Stages; Elementary Education; Elementary School Students; *Elementary School Teachers; Foreign Countries; High Risk Students; *Literacy; *Spelling; Teacher Attitudes; *Writing (Composition)
IDENTIFIERS	Australia (Western Australia); *Continuum Models; *First Steps Program (Australia)

ABSTRACT

This is one of a series of reports that document the formative research that supported the development of the "First Steps" program designed to improve the literacy and numeracy of primary school students in Western Australia, particularly those considered at-risk. The four themes of First Steps (reading, writing, spelling, and oral language) are organized around a development continuum of milestones along the child's path to literacy. In First Steps, the teacher locates the child's place along the continuum for a skill, and works from that point. In 1992, the Western Australia Ministry of Education evaluated First Steps and its continua. This report evaluates the Spelling and Writing Continua and presents teacher responses to questionnaires sent as part of the evaluation. In all, 80 teachers of grades 1, 3, 5, and 7 completed questionnaires about First Steps spelling and writing and the ways in which their students fit the continua. Findings indicate a high level of understanding among the classroom teachers participating in this evaluation. The Writing Continuum was considered to depict the development of children's writing competencies validly, and the Spelling Continuum was also approved, with two problems often identified. Indicators in the Transitional Phase were not considered more difficult that those in the developmentally earlier Phonetic Phase, and indicators in the Phonetic Phase were generally thought to be less difficult than those in the earlier Semi-Phonetic Phase. The key indicators in both continua were approved, and teachers of Years 1 and 5, who were specifically questioned, regarded the First Steps continua as validly depicting the development of literacy in the children that they teach. Four appendixes provide questionnaire results for particular indicators and developmental phases, and a fifth appendix detailing all teacher responses is available on request. (Contains 25 exhibits and 4 references.) (SLD)

Apartment 2
Portsmouth, NH USA 038

Empirical Validation of the First Steps Spelling and Writing Continua



ACER

REPORT ON THE VALIDITY OF THE FIRST STEPS WRITING AND SPELLING CONTINUA.

to the

Curriculum Development Branch

Western Australian Ministry of Education

Australian Council for Educational Research, March 1993.

Editor's Note

This document is one of a series of reports that document the formative research that supported the creation and development of *First Steps*™. As a result of this research, the Education Department of Western Australia (EDWA), in collaboration with the Australian Council for Educational Research (ACER) revised *First Steps* in response to each of the issues and questions raised by this research. *First Steps* training courses, Developmental Continua, and Resource Books are published with due amendments and alterations.

Other research documents that support the development of *First Steps* include:

Dr. Phil Deschamp:

- A Survey of the Implementation of the Literacy Component of the *First Steps* Project in WA
- The Implementation of The Literacy Component of The *First Steps* Project in ELAN Schools
- A Survey of the Effectiveness of the Focus Teacher 'B' Training for the *First Steps* Project
- Student Achievement: A Study of the Effects of *First Steps* Teaching on Student Achievement
- Case Studies of The Implementation of the *First Steps* Project in Twelve Schools
- The Development and Implementation of the *First Steps* Project in Western Australia

ACER:

- Empirical Validation of the *First Steps* Reading Continuum
- Empirical Validation of the *First Steps* Spelling and Writing Continua
- Empirical Re-Validation of the *First Steps* Spelling Continuum
- Assessment and Record of the Changes made to the Spelling Continuum
- The Impact of *First Steps* on Schools and Teachers
- The Impact of *First Steps* on the Reading and Writing Ability of Year 5 Students
- Background: *First Steps* and the ACER Evaluation & Report on the Validity of the *First Steps* Writing and Spelling Continua*

EDWA:

- Supporting Linguistic and Cultural Diversity Through *First Steps:* The Highgate Project

For more information about on-going *First Steps* research, please contact:

First Steps™ / Heinemann
361 Hanover Street
Portsmouth, NH 03801-3912
1.800.541.2086, ext. 281
firststeps@heienmann.com
www.heinemann.com/firststeps

Thanks to all the schools who agreed to participate in the evaluation of First Steps, and thanks to all the students, teachers, principals and administrative staff in schools who so generously contributed towards it.

SUMMARY OF THE MAIN FINDINGS

1. There is a very high level of understanding of the indicators from the First Steps Writing and Spelling indicators by the Year 1, 3, 5 and 7 classroom teachers participating in this evaluation.

2. The Writing continuum validly depicts the development of children's writing competencies.

3. The Spelling continuum, in general, validly depicts the development of children's spelling competencies. However two problems are identified. These are:

- the indicators in the Transitional phase are not, on average, more difficult that the indicators in the developmentally earlier Phonetic phase and,
- the key indicators in the Phonetic phase are generally less difficult than the key indicators in the developmentally earlier Semi-phonetic phase

4. All key indicators in both the Writing and Spelling continua are shown to have been appropriately defined by First Steps as 'key indicators'.

5. Generally, Year 1 and 5 classroom teachers regard the Reading, Writing, Spelling and Oral Language First Steps continua as validly depicting the development of literacy in the children that they teach.

CONTENTS

APPENDICES

Appendix A Code Numbers for the First Steps Writing and Spelling indicators used in graphical displays. Appendix A is printed on pink paper.

Appendix B. Estimates of the difficulty of First Steps indicators (1) in order of the indicators used in First Steps publications and (2) in order of the estimated difficulty of the indicators. Appendix B is printed on blue paper.

Appendix C. List of indicators from the Writing and Spelling continua not understood by some Year 1, 3, 5 or 7 classroom teachers. Appendix C is printed on green paper.

Appendix D. Questions from the Year 1 and Year 5 classroom teacher's questionnaires concerning the First Steps continua. Appendix D is printed on buff paper.

Appendix E. Set of tables describing the frequency of responses by teachers to each of the indicators in the Writing and Spelling continua.

(Note that in the version of the report sent to schools Appendix E is omitted. It consists of some 214 pages of computer print out. It was excluded because it was felt that schools would probably not require this level of detail. Printing and postage costs also needed to be considered. Should any reader of this report require a copy of this Appendix E, contact the Australian Council for Educational Research and one will be forwarded. ACER's address is:

PO Box 210 Hawthorn, Victoria 3122.

Mark the letter for the attention of Ms S. Bates)

INTRODUCTION

Background to the First Steps Project

First Steps is a program instituted by the WA Ministry of Education to improve the literacy and numeracy of primary school students. It is intended, in particular, to assist in the development of the literacy and numeracy skills of 'at risk' students. First Steps was introduced in 1988 and has been evolving since that time. So far most of the work produced as part of the First Steps project has focused upon literacy.

First Steps sees the acquisition of literacy as an integrated process. It claims, for example, that;

> "Language development cannot be divided into discrete components. Reading, writing, speaking and listening are interrelated.
> * They parallel each other
> * They complement each other.
> * They support each other.
> * They very often occur together."
>
> *(Writing Development Continuum, p. v)*

Nevertheless, First Steps holds the view that for teaching purposes it is often necessary to focus on particular aspects of language and literacy. This seems a reasonable view. The process of becoming literate, indeed of teaching language skills, is complex and if teaching strategies and methods are to be applied then they will require some form of organisation. First Steps organises aspects of literacy around four themes.

The four themes around which First Steps organises its literacy program are 'Reading', 'Writing', 'Spelling' and 'Oral language'.

Each of the four themes is, in turn, organised around a 'developmental continuum'. These continua consist of an ordered series of descriptive statements. These statements are regarded by First Steps as akin to milestones marking out a child's development along the road to literacy.[1]

During the construction of these continua, it was observed by First Steps personnel that various indicators clustered together. These clusters of indicators were incorporated into the structure

[1] More precisely, the First Steps developmental continua represent the milestones of children's development in English speaking countries where a Western school system operates. This would include such countries as Australia, Canada, New Zealand, United Kingdom and the United States. The research drawn on during the construction of the First Steps continua was largely from these countries. Until there is evidence which shows the continua generalise beyond these school systems, it is probably better to approach their use in other school systems with caution.

of the continua and were named 'phases'. For example, in the Writing continuum there were five phases identified. These were named 'Role Play Writing Phase', 'Experimental Writing Phase', 'Early Writing Phase', 'Conventional Writing Phase' and 'Advanced Writing Phase'. There are differing numbers of indicators in each phase.

Thus each continuum consists of a small number of phases. Within each phase are statements (named 'indicators') that describe various literacy skills. As well, all phases have some indicators that have been judged to be more important than other indicators within that phase. These more important indicators are named 'key indicators'. Key indicators were identified during research conducted as part of the development of the First Steps program.

First Steps proposes that the continua allow a teacher to 'locate' where a child is 'at' in his or her development of literacy skills. Once this location is identified then the most appropriate strategies and emphases for that phase of development can be applied in the classroom. (First Steps provides many strategies, each linked to the various phases of development.)

The location of a child on a continuum is established by using the key indicators. If a child has mastered *all* the key indicators within a phase then that child is said to be within that phase. In this way the phases are used to locate a child on a continuum. When they master *all* the key indicators in the next phase of development, they are then said to have moved into the next phase of development. For example, a child who has mastered all the key indicators in the Experimental Writing Phase will remain in that phase until he or she has mastered all the key indicators in the Early Writing Phase.

First Steps materials suggest that at any given time a child will probably master some skills across several of the phases. This occurs because of variation in children's development. However, it is claimed, overall, that the continua do depict the typical patterns of development to be found in children.

Background to the evaluation of First Steps

The WA Ministry of Education approached ACER in early 1992 to evaluate First Steps. Work for the evaluation began in April 1992. The evaluation was designed to measure the impact of First Steps at three levels. These levels were: (1) the school (2) the teachers and (3) the students. Questionnaires were used to gather data to measure the impact of First Steps at the school and teacher level. Reading and writing tests were used to establish the impact of First Steps at the student level. The analyses of these data are reported separately. (See *The impact of First Steps on schools and teachers* and *The Impact of First Steps on the reading and writing ability of Western Australian Year 5 students.*[2])

The evaluation was also designed to validate the First Steps continua. This was an especially important part of the evaluation because the continua and their contents lay at the heart of First Steps. This report describes how two continua were examined (or 'validated') and the results of this examination. The two continua examined were the Spelling and the Writing continua.

Aims of this report

This report has two aims. The first is to empirically validate the Spelling and Writing continua. The second is to report how classroom teachers view the validity of the First Steps continua.

Structure of the report

The report has two main parts. The first deals with the empirical validation of the Spelling and Writing continua. The second part deals with the responses of classroom teachers to the continua. This second part is based upon responses taken from questionnaires sent to teachers as part of the evaluation.[3]

[2]These reports are part of the series of reports produced as part of the ACER 1992 evaluation of First Steps.
[3]The analysis of most of the questionnaire data is undertaken in the report *The impact of First Steps on schools and teachers.*

PART 1: THE EMPIRICAL VALIDATION OF THE WRITING AND SPELLING CONTINUA.

The research objective

The objective of the empirical validation of the continua is to collect information about the typical sequence in which students learn and to compare this with the sequence of learning proposed in the First Steps continua.

Because too few schools in the sample had teachers using the Oral Language continuum and the Reading continuum, data were collected for only the Spelling and Writing continua. The research questions are therefore only addressed for these two continua.

The research questions

The following specific questions are addressed in this report:

Which First Steps indicators do teachers not understand?
Are the indicators within a phase at about the same level of difficulty?
Do the phases reflect a sequence which implies increasing difficulty?
How 'key' are the 'key indicators'?

The sample

The data for the validation of the continua were provided by teachers of Years 1, 3, 5 and 7 students from a sample of Western Australian government primary and District High schools.

The sample consisted of teachers from four old[4] First Steps PSP[5] schools, four old First Steps non PSP schools, four new First Steps PSP schools and four new First Steps non PSP schools that were selected randomly with a probability proportional to size.[6] The sample also consisted of teachers from four schools which were recommended to ACER by First Steps project personnel as especially interesting schools. The total sample is not, therefore, randomly drawn.

Unless there were more than two teachers at a year level, all Years 1, 3, 5 and 7 classroom teachers, within a chosen school, were asked to provide data. Where there were more than two

[4] An old First Steps school was defined as one with a formal involvement in the program for more than 12 months and a new First Steps school had 12 or fewer months involvement with the program.
[5] A 'PSP' school is one formally defined as disadvantaged by the WA Ministry of Education.
[6] Details of the sampling are provided in the report *The Impact of First Steps on the Reading and Writing ability of Western Australian Year 5 students.*

teachers from a year level, two teachers were randomly selected. Altogether 99 teachers were approached to participate in this part of the evaluation. Of these 99 teachers, 80 returned data that could be used. Exhibit 1 shows the numbers of teachers who responded by continuum for each Year level.

Exhibit 1: Number of teachers providing data for the validation of the Writing and Spelling Continua for each Year level.

	Yr 1	Yr 3	Yr 5	Yr 7	Total
Writing	10	9	10	12	41
Spelling	10	8	12	9	39
Total	20	17	22	21	80

The data

The data consisted of judgements made by teachers about the extent to which each of up to ten students in their class exhibited evidence of having demonstrated the competence described by each of a number of First Steps indicators. (The teachers made these judgements about each individual child in turn and not about the group of children.) These judgements were recorded on a computer by the teachers. They tapped one of a set of appropriate keys to register their response. There were two sets of responses available to a teacher depending upon which indicator was displayed to them. The response set to be used was pre-determined. Teachers could not choose which response set to use.

The first response set was:

Y - (Yes/Most of the time)

This key was to be pressed if the named student usually demonstrated this competence.

N -(No/Hardly Ever)

This key was to be pressed if the named student did not or hardly ever demonstrated this competence.

U - This key was to be pressed if the teacher was unable to make a judgement. If they responded with U, the program asked the teacher to select one of the following:

1 - "I have not yet had an opportunity to gather information relating to this indicator."

2 - "I don't understand the wording of this indicator."

If the teacher entered 'U' then the program displayed all students' names, and beside them the response - 'U'. That is, if the teacher did not understand the indicator for one student, it was assumed that they did not understand it for all students. If the teacher

had understood the indicator, then after all students had been evaluated with respect to that indicator, the results of the teacher's judgements were displayed on the screen and an opportunity was given to alter the data.

The use of the first response set was not appropriate for all indicators. If used alone it would have led to ambiguous responses for some indicators. For example, consider the indicator from the Experimental phase of the Writing continuum: "The child often begins sentences with 'I'." A response 'Hardly ever' could mean that the child 'Hardly ever starts a sentence with 'I' because he or she hardly ever is able to write a sentence.' But the response 'Hardly ever' could also mean that the child 'Hardly ever starts a sentence with 'I' because they have advanced beyond this level of writing.' To overcome this, a second response set was developed. This second response set had the additional category of 'Beyond'.

The second response set was:

B - (Beyond this level.)
This key was to be pressed if (1) the indicator was phrased negatively and the student demonstrated evidence of being able to perform the converse of the indicator, (2) the indicator began with the phrase "Beginning to ..." and the student had fully acquired the skill referred to in to the indicator or (3) a student had developmentally 'left behind' the indicator and so no longer demonstrated evidence of it (as opposed to having yet to develop this skill).
Y - (Yes/Most of the time)
This key was to be pressed if the student usually demonstrated this competence.
N -(No/Hardly Ever)
This key was to be pressed if the student did not or hardly ever demonstrated this competence and was yet to move beyond the level required to demonstrate competence on this indicator.
U - This key was to be pressed if the teacher was unable to make a judgement. (The same categories - 1 or 2 - as for the first response set were then displayed.)

In the data analysis 'Yes' and 'Beyond' were treated as having identical meaning and so coded to the same value. Responses with the value 'U1' and 'U2' were excluded from the analysis which located the indicators on a continuum of development.

Most teachers were asked to provide data for the first five female students on a class list and for the first five male students on a class list. If a class had fewer than five female students or less than five male students then teachers were asked to 'top up' with other students from the class. In some small schools and in some composite classes there were less than ten students at a

given year level. In these cases teachers were asked not to top up with students from other Year levels. Those Year 1 teachers collecting data for the Writing continuum were asked to collect data for the first four female and first four male students because of the large number of indicators for which they were being asked to provide data. This avoided placing an intolerable work load on these teachers. Exhibit 2 shows the total number of students involved in the study by continuum type for each year level.

Exhibit 2: Number of students involved in the study for the validation of the Writing and Spelling Continua for each Year level.

	Yr 1	Yr 3	Yr 5	Yr 7	Total
Writing	80	90	103	110	383
Spelling	90	74	106	83	353
Total	170	164	209	193	736

The data thus consist of judgements made by classroom teachers about the competency of 736 selected students on a number of different First Steps indicators.

The data for the validation of the continua were collected in November 1992. The children thus had had about 9 months in which to acquire many competencies. As a result, all children were able to demonstrate competencies for the easiest indicators. This meant, because of limitations in the technique used to analyse these data, that these easiest indicators were not used in the validation of the continua. (This is discussed later. See Page 21.)

The design of the research

It was decided to design the data collection in such a way as to avoid asking teachers about indicators which would be unlikely to be observed in their students. For example, Year 1 teachers were not asked to provide data about the indicators in the Conventional or Advanced writing phases because it was felt to be most unlikely that any Year 1 students would have developed such high levels of writing skill. In order to ensure that the data could still be used to depict a sequence of development across all phases of a continuum, each Year level had at least one phase in common with the Year level below or with the Year level above it. Exhibit 3 shows which phases of the Writing continuum were used by Year level, how these phases overlapped and how many indicators were in each phase. Exhibit 4 shows the same for the Spelling Continuum. The ticks in Exhibits 3 and 4 show which indicators from which phase were used with the Year level heading the column in which the ticks appear. For example, in

Exhibit 3, the column under the title 'Yr 1' indicates that Year 1 teachers providing data on the Writing Continuum had indicators drawn from the 'Role Play', the 'Experimental' and the 'Early' writing phases. This means that for these Year 1 teachers there were 114 (32 + 33 + 49) indicators judged per child.

Exhibit 3: Number of indicators per phase of the First Steps Writing continuum for each Year level and distribution of phases across Year levels.

Writing Continuum Phases	N. of Indicators	Yr 1	Yr 3	Yr 5	Yr 7
Advanced	40				√
Conventional	52		√	√	√
Early	49	√	√	√	
Experimental	33	√			
Role Play	32	√			
Total N of Indicators	206	114	101	101	92

Exhibit 4: Number of indicators per phase of the First Steps Spelling continuum for each Year level and distribution of phases across Year levels.

Spelling Continuum Phases	N. of Indicators	Yr 1	Yr 3	Yr 5	Yr 7
Independent	20				√
Transitional	20		√	√	√
Phonetic	23	√	√	√	√
Semi Phonetic	21	√			
Preliminary	24	√			
Total N of Indicators	108	68	43	43	63

Teachers were allocated phases according to the year level that they taught. Phases were matched to year level using advice from the First Steps project personnel. The matching was designed to ensure that the chosen phases were appropriate to the level of development of the students. Appropriate phases were ones in which it was expected that most students would *not* exhibit competency in either all or none of the indicators.

It will be observed that there were considerably fewer indicators in the Spelling continuum than in the Writing continuum. Thus teachers providing data about the Writing continuum were, depending on the Year level taught and the number of students assessed, making in total about 800 to 1000 judgements upon the competence of their students compared with between about 400 and 700 judgements made by the teachers using the Spelling continuum.

Before allocating teachers to a continuum, forms were sent to schools asking which continua teachers had used in their classrooms. Once it was established from the returned forms that there were too few teachers in the sample of schools who were using the Oral Language and the Reading continua to enable these continua to be validated, teachers were allocated the Spelling or the Writing continuum. They were allocated one of these two continua by taking three factors into consideration. The first factor was whether the teacher had used a First Steps continuum in their teaching. If a teacher had not used a continuum they were not allocated that continuum. Thus all teachers made judgements about indicators from a continuum with which they were familiar. This was done to facilitate teachers' judgements about the competency of their students. The second factor affecting which continuum a teacher was allocated came into play only when a teacher had used both the Spelling and the Writing continua. In this case a teacher was allocated a continuum which evened out the distribution of teachers across the Year levels and the continua. For example, if during the allocation of the continua there were, say, too few Year 1 teachers given the Spelling continuum, then a Year 1 teacher who indicated that he or she had used both continua, was allocated the Spelling continuum. The third factor which affected which continuum a teacher received only came into play when there were two teachers, in the same school at the same Year level, who had both used the Spelling and Writing continua. In this case each was given a different continuum to reduce the chance of their making shared judgements.

An examination of Exhibit 1 (on Page 6) shows that, for each Year level for both the Spelling and the Writing continua, approximately the same number of teachers provided data.

Method of data collection

All teachers were sent a computer disk. On this disk was a computer program written by staff at ACER which, when run, prompted teachers for responses to questions. These responses were stored on the disk and when the teacher had entered the data, the disks were returned to ACER. Each teacher received a disk containing the teacher's name, year level, and the indicators for the phases of the continuum for which they would be providing data.

When the program was run the teacher was first asked to enter the names of the students to be used, that is, the names of the first five boys and the first five girls on a class list. (Where this was not possible, alternatives described above were adopted.[7])

Teachers were next asked the following questions about each child:

What is the child's sex? (M/F)

Is English the first language of the child. (Y/N)

Is the child an Aboriginal or Torres Straits islander? (Y/N)

Is the child receiving English as a Second Language assistance? (Y/N)

Does the child have a disability that could significantly affect achievement in English? (Y/N)

Once this was done the teacher was presented the text of an indicator with the instruction to asses each student with respect to the indicator on display. The indicators were presented to teachers in a random order. The teachers knew only which continua (Spelling or Writing) the indicators were from and that the indicators came from one of two or three phases. They did not know, unless they recalled it from their own use of the continuum, from which phase a displayed indicator came. Nor did they know if an indicator was a key indicator.

It was estimated that teachers would take approximately 2 hours to make all their judgements and enter the data. The computer program was designed so that teachers could quit before completing all the data entry and resume at a later time.

Method of data analysis

The data for the empirical validation were analysed using the computer program "Quest" (Adams and Khoo, 1992) which produces Item Response Theory calibrations of indicators and measures of student achievement. An outline of this approach is provided below.

Data analysis

The first step in the analysis was to analyse data that had been collected about the students in the study. If these children had characteristics which suggested that their development of literacy skills might occur in a different order or at a different rate, from most other students, then it was important to know this because it could effect the interpretation of results.

[7] See the section 'Design of the Research on Page 6 ff.

It was possible to remove non-typical children from the analysis in an attempt to avoid any possibly distorting effects on the results. However, it was decided to retain all children in the subsequent analyses because First Steps was instituted to assist precisely those children whose non-typicality placed them 'at risk'. Also, keeping all these children in the analysis means that the results are based upon a group of students who probably more accurately reflect the make up of typical classrooms.

Attributes of the children

1. Sex

It is generally the case that girls are more precocious than boys in the acquisition of literacy skills. It was therefore felt important to describe the distribution of the sex of the students. Exhibit 5 shows this for each Year level for the Writing continuum and Exhibit 6 shows this for the Spelling continuum.

Exhibit 5: Frequency and percentage of students involved in the study of the Writing continuum by sex for each Year level.

	Yr 1	Yr 3	Yr 5	Yr 7	Total
Female	40 (50%)	45 (50%)	51 (49%)	57 (52%)	193 (50%)
Male	40 (50%)	45 (50%)	52 (51%)	53 (48%)	190 (50%)
Total	80 (100%)	90 (100%)	103 (100%)	110 (100%)	383 (100%)

Exhibit 6: Frequency and percentage of students involved in the study of the Spelling continuum by sex for each year level.

	Yr 1	Yr 3	Yr 5	Yr 7	Total
Female	45 (50%)	37 (50%)	52 (49%)	40 (48%)	174 (49%)
Male	45 (50%)	37 (50%)	54 (51%)	43 (52%)	179 (51%)
Total	90 (100%)	74 (100%)	106 (100%)	83 (100%)	353 (100%)

Exhibits 5 and 6 show that the number of boys and girls is very similar for each Year level for both continua. This was expected because of the selection procedure that was used.

2. English as a second language (ESL)

It was important to identify children for whom English is a second language because according to research conducted by the English as a Second Language Unit, WA Ministry of Education, the 'levels of competency displayed by second language learners do not reflect their actual levels of concept development.' (*Writing Developmental Continuum, p. v)* If there were large numbers of ESL children used in the validation of the continua then a distortion of the relationship between the skill levels of different phases may have occurred. Exhibits 7 and 8 show the number and percentage of students by first language type for each year level

Exhibit 7: Frequency and percentage of students involved in the study of the Writing continuum by first language type for each Year level.

	Yr 1	Yr 3	Yr 5	Yr 7	Total
ESL	2 (3%)	5 (6%)	9 (9%)	11 (10%)	27 (7%)
English	78 (98%)	85 (94%)	94 (91%)	99 (90%)	356 (93%)
Total	80 (100%)	90 (100%)	103 (100%)	110 (100%)	383 (100%)

Exhibit 8: Frequency and percentage of students involved in the study of the Spelling continuum by first language type for each Year level.

	Yr 1	Yr 3	Yr 5	Yr 7	Total
ESL	7 (8%)	7 (10%)	17 (16%)	4 (5%)	35 (10%)
English	45 (92%)	37 (90%)	54 (84%)	43 (95%)	179 (90%)
Total	90 (100%)	74 (100%)	106 (100%)	83 (100%)	353 (100%)

Exhibits 7 and 8 show that the proportion of ESL students is relatively low. The highest proportion of ESL students is 16%. This occurs at Year 5 level in the Spelling continuum. All other year levels in both continua have 10% or fewer ESL students.

Related to the data about first language is the number of students receiving ESL assistance. The number of these students in the sample was very small. For the Spelling continuum there was one student in each of Year 5 and Year 7 receiving ESL assistance. For the Writing continuum there were two Year 3 students and three Year 7 students receiving ESL assistance.

The data identifying whether a student had English as a second language were also collected so that analyses could be run separately for this sub-group to see if particular indicators within phases were located differently on the scale of difficulty. There were, however, too few of these students for these analyses to be conducted.

3. Disability affecting achievement in English.

Teachers were asked if any of the children about whom they were making judgements had a disability that could "significantly affect achievement in English". As Exhibit 9 shows, the proportion of students described by teachers as having a disability that could affect performance in English was low.

Exhibit 9: Frequency and percentage of students involved in the study with a disability affecting their performance in English for the Writing and Spelling continua for each Year level.

	Yr 1	Yr 3	Yr 5	Yr 7	Total
Writing	3 (4%)	2 (2%)	7 (7%)	5 (9)%	17 (4%)
Spelling	2 (4%)	6 (8%)	1 (1%)	0	9(3%)

4. Aboriginality

The data identifying whether a student was an Aboriginal or a Torres Straits Islander were collected so that if sufficient numbers of students were identified, analyses could be run separately for this sub-group. As with the ESL students there were insufficient numbers for these analyses to be conducted. The data on Aboriginality were, therefore, not used in the validation of the continua.

Empirical validation of the Writing and Spelling continua

In this part of the report four main questions are addressed:

1. Which First Steps indicators do teachers not understand?
2. Are the indicators within a phase at about the same level of difficulty?
3. Do the phases reflect a sequence which implies increasing difficulty?
4. How 'key' are the 'key indicators'?

In answering these questions, the first and fourth are addressed directly. The second and third questions, however, need to be approached less directly. To answer these questions, the method used to validate the continua is first described. Secondly, an ideal model is proposed. This model shows how the level of difficulty of indicators within a phase ought to appear if the continua are to depict children's development. The model also shows how the phases ought to reflect the increasing levels of difficulty along the developmental continua. Once this ideal model is established, the validation of the continua using empirical data can begin. The data are evaluated by comparing them with the ideal model. The closer that the data approach the patterns described by the ideal model the more valid the First Steps continua will be. It is only at this point that the second and third questions can be answered.

Each of the four questions is now addressed.

Which First Steps indicators do teachers not understand?

It is important to know how well teachers understand the indicators. If there are many misunderstandings then the continua will not be consistently used. Another, and more immediate concern, is that if the indicators are not understood well then, then the data supplied by teacher for this report will be adversely effected. The data used here to validate the continua rely on teachers understanding the indicators because any indicators which teachers do not understand are excluded from the validation procedure.

When making judgements about a student's competency on an indicator teachers were able to indicate whether they understood the indicator or not. Analysis of their responses shows that the indicators are well understood by the teachers who participated in this section of the evaluation. It should be noted, however, that this is not evidence that they all understand the

indicators in the same way. One teacher, for example, described her difficulty in interpreting one of the indicators in a letter accompanying the data disk she sent back. Of the indicator "The child uses double letters correctly." She wrote:

> "I interpreted this as when utilising word building ie 'model - modelling'. ... You may mean as medial letters eg Happy."

Other teachers well may have interpreted this indicator as meaning any usage of double letters.

From the analysis of the 'U1' responses[8] it was found that of the 108 indicators from the Spelling continuum 10 (9%) were not understood by some teachers. Of the 10 indicators not understood, 1 came from the 24 indicators in the Preliminary Phase, 2 came from the 21 in the Semi-phonetic phase, 0 came from the 23 in the Phonetic Phase, 3 came from the 20 in the Transitional Phase and 4 came from the 20 in the Independent Phase. Of these 10 indicators, 9 were not understood once and 1 indicator was not understood by 2 different teachers. The indicator not understood twice was: "The child is aware of the social obligations of a speller." All other indicators were understood by all teachers.

Of the 206 indicators in the Writing Phase 25 (12%) indicators were not understood by at least some teachers. Of the 25 indicators not understood from the Writing continuum, 0 came from the 32 indicators in the Role Play phase, 1 came from the 33 in the Experimental Writing phase, 10 came from the 49 in the Early Writing Phase, 6 came from the 52 in the Conventional Writing Phase, and 8 came from the 40 in the Advanced Writing Phase. Of these 25 indicators 14 were not understood once, 8 were not understood by 2 teachers, 2 were not understood by 3 teachers and 1 indicator was not understood by 9 teachers.

The two indicators not understood by three teachers were:

"The child writes a range of words that are personally significant." and,

"The child shows evidence of personal voice (where appropriate)."

The indicator which was not understood by nine teachers was:

"The child writes to get things done."

This indicator seems to require clarification.

Appendix C lists all indicators not understood by teachers and the number of teachers for whom they were problematic.

---

[8]That is, those indicators that teachers recorded as not understood. See Page 6ff for further information about the meaning of 'U1' responses.

In summary, in both the Spelling and Writing continua about 90% of all indicators were understood by all the teachers who responded to this part of the evaluation. Of the 10 % of indicators not understood by all teachers, most of these were not understood on only one or two occasions. Thus there was a very high level of understanding of the indicators by teachers.

Validation

1. Calibrating indicators

Before considering the results of the empirical validation of the Spelling and Writing continua it is necessary to outline how the data were analysed.

The first aim of the data analysis was to 'calibrate' the indicators for Spelling and Writing on separate developmental continua. The calibration process (based on the Rasch[9] model) estimates a 'difficulty' level for each indicator on the relevant continuum. In general, the greater the number of students achieving an indicator, the 'easier' (lower on the continuum) that indicator is estimated to be. The calibration process thus parallels the intention of the First Steps continuum construction process: to locate the indicators at positions along a continuum.

Put more simply, a First Steps continuum can be likened to a pathway along which children progress, acquiring literacy skills as they go. The further along this pathway the child goes the more difficult it becomes. On a real path the difficulty increases as a function of physical tiredness. On the metaphoric pathway to literacy, the difficulty increases because the competencies the children are seeking to gain require higher levels of skill. The First Steps indicators act as sign posts on this path. They mark out where the child is and so what the child has achieved and has yet to achieve. The first aim of the analysis is to identify where these sign posts are along the path and, in so doing, to identify the difficulty of each of the indicators.

2. An ideal model for the distribution of indicators within phases along a developmental continuum.

Having estimated the difficulty of the First Steps indicators - the first aim of the data analysis - the next aim is to establish how well the observations teachers make about the development of literacy match the developmental continua proposed by First Steps. This task is referred to as the empirical testing of the validity of the First Steps continua.

---

[9]Named after the Danish psychometrician who invented the mathematical procedures upon which Item Response Theory is based.

The empirical testing of the validity of the First Steps continua involves comparing the order of the indicators proposed by First Steps with the order produced by the analysis of the data supplied by teachers. This comparison, however, is constrained by the fact that the indicators are ordered in First Steps by allocating them to phases. Indicators within a phase are not ordered.[10] Consequently, if a comparison between the ordering of the indicators derived from the teachers' data and a First Steps continuum is to be made, then the indicators must be treated by grouping them into phases. This raises a question: If the indicators are to be ordered within phases how should the phases group the indicators along the scale of difficulty?

To begin answering this question a model is proposed showing the ideal relationship between groups of indicators categorised into phases when those phases are ordered to reflect sequential development. Such an ideal model will not be found in reality[11] because of natural (or small random) variation in the way in which students develop literacy skills, variation in the teachers' perceptions of students' competencies and because of errors made by teachers in their judgements. Some teachers may also use teaching strategies which direct children's development away from normal patterns of development. Nevertheless, such a model provides a standard against which to assess how well the First Steps continua approach the ideal.

The model proposes first that the phase depicting the earliest stages of development should have all of its indicators situated towards the bottom or less difficult end of the scale. Conversely, the phase depicting the most advanced stages of development should have all its indicators situated towards the top or most difficult end of the scale. Other phases should fall between these extremes in the appropriate order. Secondly, each group of indicators within a phase should occupy proportionally the same distance along the scale of difficulty as each of the other groups of indicators. Thus, for example, if there are five phases each should have a range over 20% of the scale. Thirdly each group of indicators should occupy a unique location on the scale. The location of the phases should not overlap along the difficulty scale. Exhibit 10 shows the proposed ideal distribution of indicators by phase.

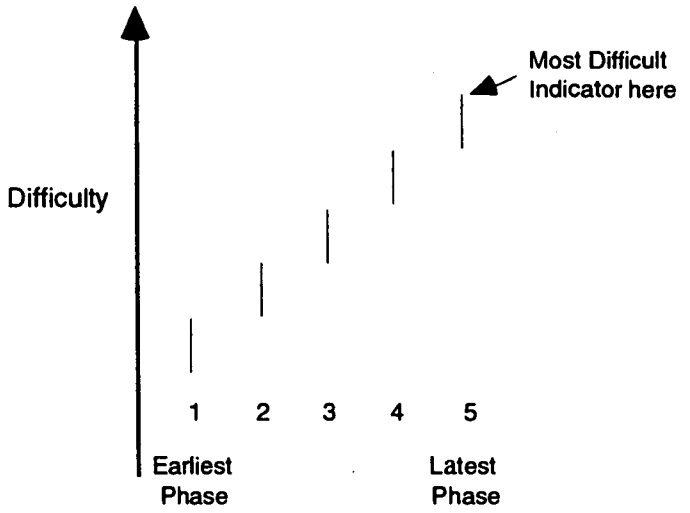
The short vertical lines in Exhibit 10 represent the spread of difficulty of the indicators within each phase. The most difficult indicator is situated at the top of the range of indicators in Phase 5. This is marked on the exhibit. Exhibit 10 shows that the spread of estimated difficulty for the indicators within each phase is about the same. There is no overlap between the phases nor is there a gap between them. The reasons for each of the attributes of this ideal model are now given.

---

[10]Some indicators are classified as more important (the 'Key' indicators) but they are not ordered in terms of the sequence of development within the phase.

[11]Indeed if such a perfect fit was found it would raise serious questions about the reliability of the data.

Exhibit 10: Depiction of an ideal model for the distribution of indicators within sequentially ordered developmental phases.



Early phases should contain indicators low on the difficulty scale, intermediate phases should contain indicators of intermediate difficulty and later phases should contain indicators of highest difficulty because if the phases do not, then they are not depicting the sequence of development that children go through. The reason for having the phases is to depict this sequence of development.

There should be a spread of difficulty scores within a phase because development is seen as occurring along a continuum and not in stages. If it occurred in stages it would be expected that each indicator within a phase would have the same estimated difficulty. However, the spread of indicators within a phase should not be too wide because this will lead to poor discrimination when plotting the development of children. There is little point in allocating a child to a stage if that stage, for example, covers a significant span of their school years. Reasonably fine levels of discrimination are required if development is to be charted and the indicators within a phase are to operate as something more than a checklist of skills. This can be achieved by having the phases ordered along the difficulty scale such that each occupies the same proportion of the total spread of the scale. It should be noted that while 'equal spread' might be thought of as an ideal, it is not necessary to the successful construction and use of a continuum.

The spread of the estimates of difficutly within one phase should not overlap with the spread in any other phase because this can lead to difficulty in establishing the level of development of the child. For example, take the extreme case where the spread of data within two phases entirely overlap each other on the difficulty scale. When this occurs allocating a child to one of those phases does not assist in locating that child along the developmental continuum. This

suggests that the more overlap there is between phases, the more ambiguity there will be about the level of development of a child.

Ideally, gaps between the spread of the data within one phase and an adjoining phase should also not occur. A gap means that if the child is at a location in their development along the continuum where this gap occurs then their level of development may be under estimated by a teacher using such a continuum. However, as a gap does not lead to a confusion about the sequence of development of the child along a continuum it is less of a problem than having large overlaps between the phases.

If the ideal model is accepted as a valid depiction of how the indicators within phases ought to be ordered along the difficulty scale then two of the main research questions can be interpreted in terms of this model. The first question - Are the indicators within a phase at about the same level? - requires that the spread of the indicators along the difficulty scale within any one phase is approximately similar to the spread of any other phase. The second question - Do the phases reflect a sequence which implies increasing difficulty? - requires that the location and overlap in the spread of the indicators along the difficulty scale within each phase is compared to the ideal location and the ideal spread of phases. This will involve seeing if there is any overlap or gaps between the phases and assessing how consequential these gaps seem when compared to the ideal model.

This method of contrasting the observed with an ideal model can also be used to examine the location of the difficulty estimates of the key indicators within phases. This will permit some judgements to be made about their appropriateness as key indicators. The research question about their 'keyedness' is, however, largely dealt with using another approach.

3. The relationship of the ideal model of a developmental continuum to the validation of the First Steps continua.

The validation of the Spelling and Writing continua will involve using the observations made by teachers about the students' competencies on indicators to estimate indicator difficulties. These observations can then be compared with the ideal model depicted in Exhibit 10. How well the teachers' observations match the model will shape the conclusions drawn about the validity of the Spelling and the Writing continua.

4. Validation of the Writing Continuum

The validation begins by displaying the indicators of the Writing Continuum along the difficulty scale in the most detailed way. As the argument about the validity of the Writing continuum develops these data are displayed with less and less detail. It was decided to begin with the most detailed display because only this display allows individual indicators to be identified. Once the reader is familiar with this display they can refer to it if particular indicators in other displays need to be identified.

Exhibit 11 shows the distribution of the 199 indicators in the First Steps developmental Writing continuum along a scale of difficulty. The indicators are grouped into one of the five phases of this continuum. In this exhibit the indicators are represented by a code number. The code numbers were used to make the graphical display readable. Indicators are numbered in the order given in First Steps publications. Refer to Appendix A which lists these code numbers and their associated indicators. In Exhibit 11 the key indicators are marked in bold.

The Rasch modelling technique requires that those indicators for which either all or none of the students demonstrated a competency are excluded from the analysis.[12] Thus not all indicators are displayed in the body of Exhibit 11. The seven excluded indicators are listed in a box to one side of the display.

[12]Basically, the Rasch modelling technique estimates the difficulty of a competency by comparing the number of students who exhibit a competency with the number who do not. If all of the students in the sample exhibit a competency, then it is impossible to estimate the difficulty of the item except to say that it is less difficult than the easiest competency for which there is a measure. It is not possible, however, to establish how much easier it is. Similarly, if none of the children demonstrate a competency, then all that can be said is that it is more difficult than the hardest competency. Because these competencies cannot be estimated, they are excluded from the analysis.

Exhibit 11: Estimated difficulty of First Steps indicators from the Writing Continuum within phases of development.

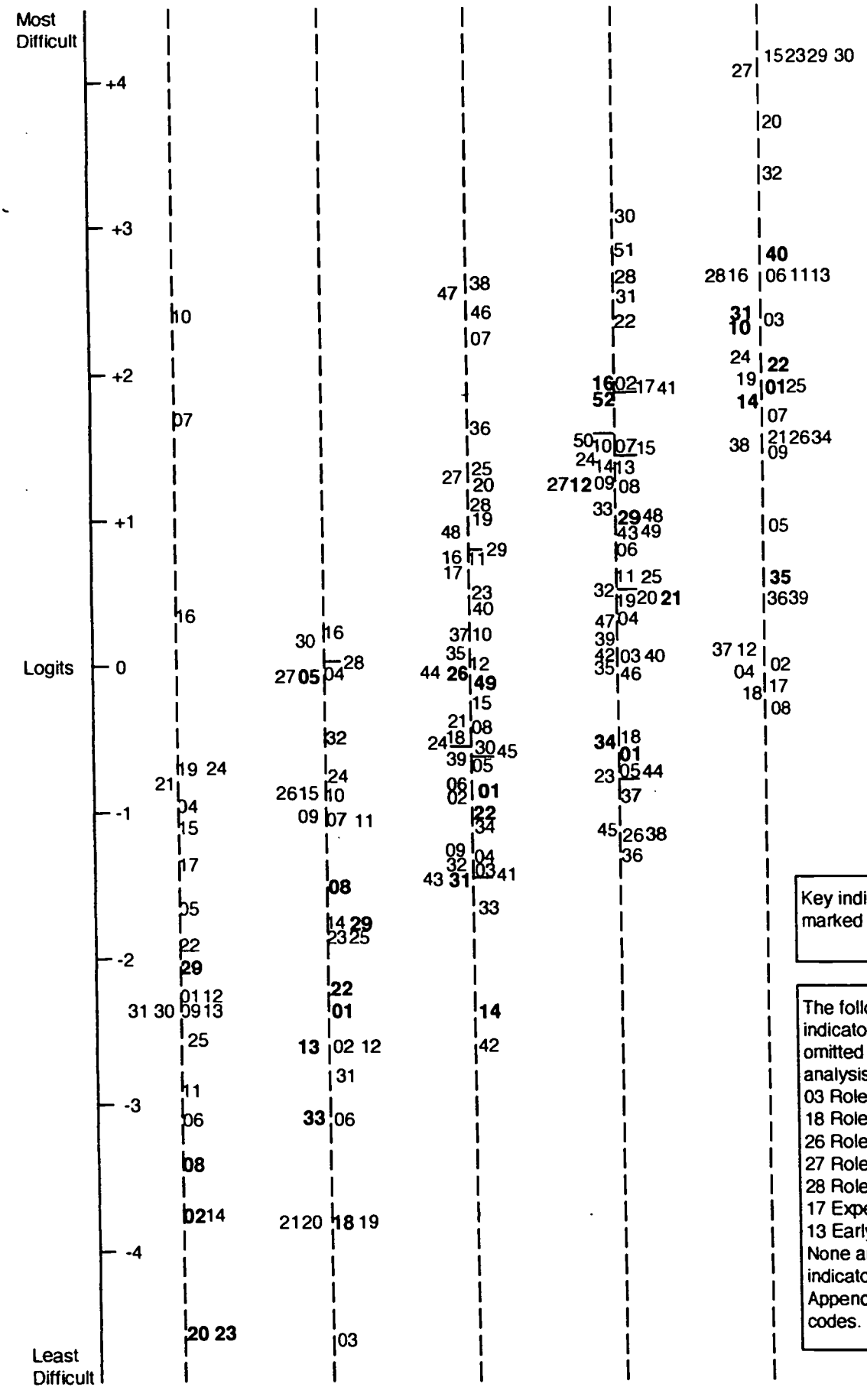


Exhibit 11 is useful for tracking the identity of individual indicators or for locating a known indicator. For example, it is clear from Exhibit 11 that indicators 10, 07 and 16 in the Role Play phase require further investigation as they seem to represent skills that are considerably more difficult to attain than those skills represented by the other indicators in this phase. By referring to Appendix A these indicators can be identified. Consider indicator 10, the text of which is 'Makes random marks on paper.' Clearly, this item has a high estimated difficulty because of either error or doubts about interpretation by teachers.[13] Making random marks on a page as a form of writing typically occurs in preschool or Year 1. On the other hand indicator 07, the text of which is 'dictates for adult to write', may be a more complex task than was estimated by First Steps. If it is, then this may constitute evidence for re-allocating it to another phase. Alternatively, it may be a simple task which teachers are understanding as referring to a different and more complex task. In this case, the indicator needs to be written more precisely. While this detailed examination of 'outliers' can be useful for modifying the continuum in the future, the present concern is with the general patterns in the data. To do this, less detailed displays (similar to Exhibit 10 which shows a graphical depiction of the ideal model) are required. These are now described and displayed.

Exhibit 12[14] shows the data locating the indicators within phases as points. An examination of this dot plot shows that there is a clear trend in these data. Generally each successive developmental phase groups indicators into bands along the difficulty scale at locations which reflect increasing difficulty. In this respect the phases group the indicators of the Writing continuum in the order of the ideal model.

Exhibit 12 is, however, unsuitable for making judgements about the relative spreads and the overlap of the phases. It is not suitable for two reasons. First some dots represent more than one indicator (those with the same estimated difficulty) and so not all data are visually represented here. Secondly, a visual examination of a dot plot such as Exhibit 12 can only estimate the range[15] of the estimates. The range, however, is not the best measure of spread. It is susceptible to the effect of outliers - points which assume an unexpectedly extreme value when compared with the other values in the group of which they are part. There is some evidence in Exhibit 12 that some indicators are 'outliers'. For example, there are three indicators with relatively high estimates in the Role Play phase, another three possibly too high in the Early Writing phase and perhaps two indicators with relatively low estimates in the

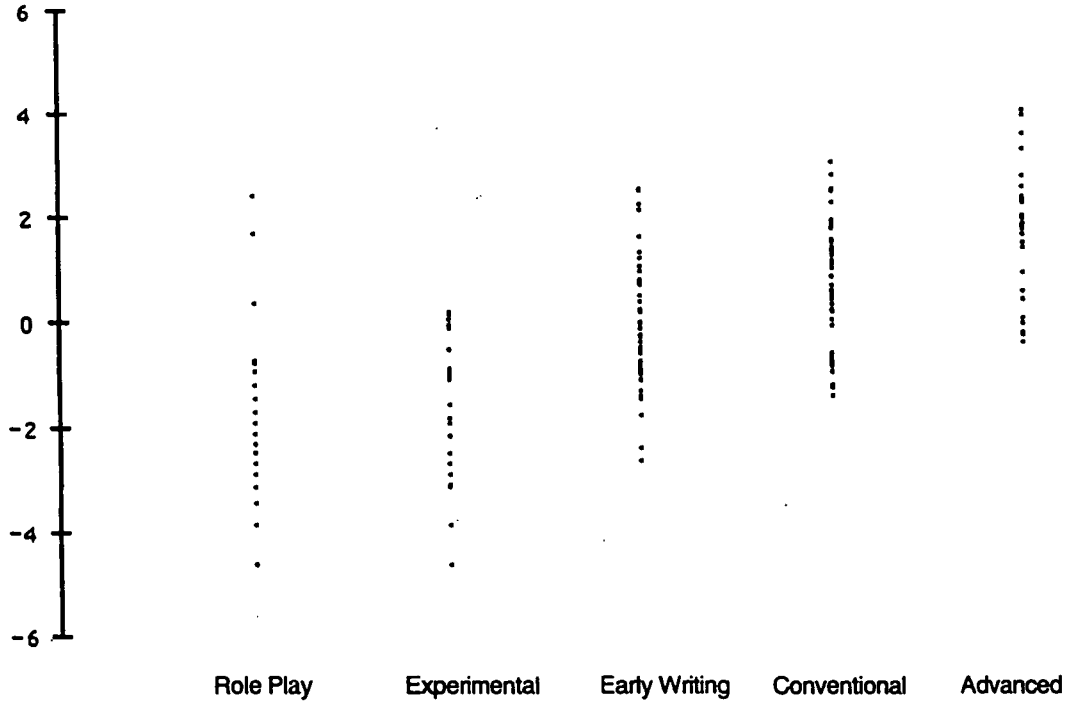
[13]It is likely that the teachers responded to this indicator with 'No' meaning that the child 'no longer makes these marks as a form of writing'. The appropriate response category in this instance was 'Beyond'. This is a nice example of how 'errors' lead the data away from a perfect fit with the ideal model.

[14]The difficulty scale used for this and all related plots is measured in logits. A logit is the odds of an outcome transformed to a logarithm with the base *e*.

[15]The range of the scores is the distance between the highest and the lowest score.

Experimental phase. There are other, better measures of the spread than the range. To complement Exhibit 12 then, another display depicting the spread of the data in a systematic way, which reduces the effect of outlying points, is required. This is done in Exhibit 13. Exhibit 13 shows the data using the median to represent the measure of central tendency and the inter quartile range (the central 50% of the data) to represent the spread. These measures are resistant to the effect of outliers. The data in Exhibit 13 are displayed using box plots. The lower boundary of the box identifies the value above which 75% of the indicators fall and the upper boundary of the box identifies the boundary below which 75% of the indicators fall. Thus, 50% of the indicators are located between the top and the bottom of the box. The horizontal line inside the box marks the location of the median. In some boxes the median is not located centrally. In these cases the data are concentrated on the side of the box which is closer to the median. For example, in Exhibit 13 in the Role Play phase the indicators are distributed more densely towards the lower end of the box. The 'whiskers' on the top and the bottom of the box mark out the location of the 90 and the 10 percentiles. Small circles denote the location of an outlier (as defined by the algorithm used to construct the box plot by the computer program).

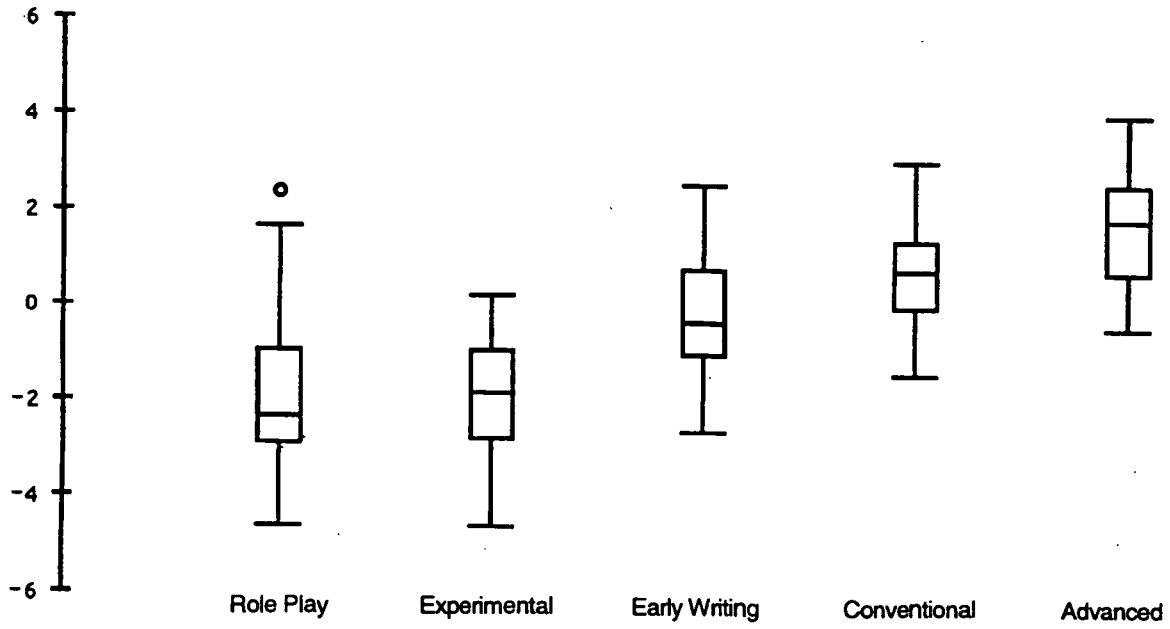
Exhibit 12: Difficulty estimates of indicators within phases of the First Steps Writing Continuum



In examining Exhibit 13 it is the location of the median and the length and location of the box - the central 50% of the data - which is of most importance. It is this box which is taken as giving a fair representation of the spread of the indicators within a phase.

The location of the median for each phase confirms the conclusion drawn from the examination of the dot plot (Exhibit 12). The median for each phase is located successively higher on the difficulty scale. This is consistent with the claim that the phases contain indicators which are grouped by their location along a continuum of development.

Exhibit 13: Box plots of difficulty estimates of indicators within phases of the First Steps Writing Continuum



The boxes in Exhibit 13 are approximately the same length. Importantly, no one phase has a disproportionately wide spread. Most phases thus have an appropriate width to their spread. The observed data, in this regard, closely match the ideal model. This is evidence in support of the claim that the Writing continuum is a valid depiction of the development of writing skills.

The final element to be examined in the validation of the Writing continuum is the extent to which the phases within the continuum overlap along the difficulty scale. An overlap between phases is a problem because if it occurs to any great extent the phases will not depict development. Its practical effect is to jeopardise the ability of a teacher to use the phases to locate a child on the developmental continuum.

An examination of Exhibit 13 shows that there is very little overlap between the Experimental and the Early Writing phases. There is somewhat more overlap between the Early Writing and the Conventional phases and between the Conventional and Advanced phases. There is clearly considerable overlap between the Role Play and the Experimental phases. At this point it is important to note that the location of the median and the spread of data within the Role Play phase have been effected by the omission from the analysis of five indicators. These indicators

were omitted because every child exhibited evidence of the competency that they describe. It is a requirement of the Rasch modelling technique that these observations are removed from the analysis. That all children demonstrated competency on these five omitted indicators means that the locations of these indicators are lower on the scale. With the available data it is not possible to establish how much lower. Consequently, the median for the Role Play phase is actually lower than is displayed in Exhibit 13. Similarly, the indicators from this phase are likely to spread further down the scale and so not overlap as much as they do in Exhibit 13. Nevertheless the overlap is considerable between these two phases. This is a concern.

However, in First Steps the location of a child within a phase is not established by the use of all indicators. There are certain indicators which have been defined as 'key' and it is these 'key' indicators which are used to allocate a child to a phase of development. Accordingly, it is how these key indicators are spread within phases and how much overlap there is between phases for these key indicators which is critical for establishing how reliably children will be placed into a phase. Exhibit 14 was prepared using the estimates of difficulty for the key indicators only.

Exhibit 14: Box plots of the difficulty estimates of key indicators within phases of the Writing Continuum.

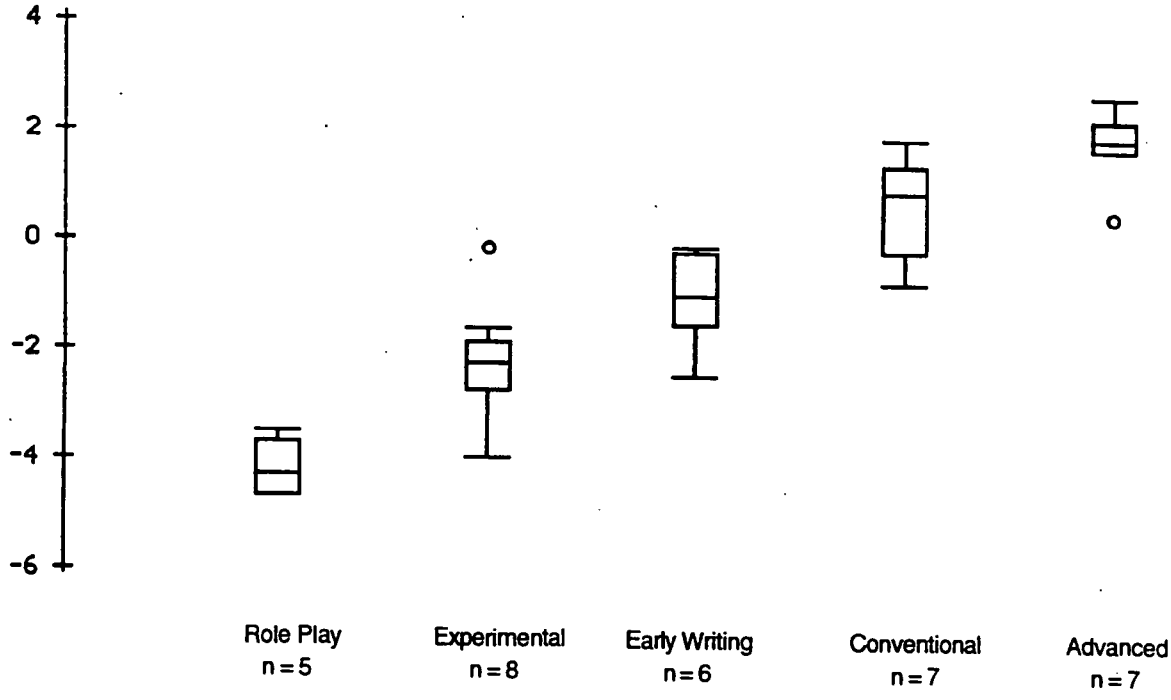


Exhibit 14 shows that there is a gap between the top of the box depicting the Role Play phase and the bottom of the box depicting the spread of the indicators within the Experimental phase. However, there is a near perfect match between the bottom and top of adjoining boxes for all remaining phases. The pattern of the data displayed in Exhibit 14 closely approaches the pattern displayed in the ideal model. This is strong evidence that the key indicators of the

Writing continuum are validly depicting the sequence of development and that they are doing so with considerable precision and efficiency.

It will be noted that the spread of the key indicators in the Advanced phase is somewhat narrow. This suggests that, given the good match between the bottom of the spread for this phase and the top of the spread for the Conventional phase, that other key indicators higher up the scale might be usefully identified for the Advanced phase. The two outliers - one in the Experimental phase (code number 205) and one in the Advanced phase (code number 535) might be examined more closely to see if they properly belong in another phase.

In summary then, the evidence collected from the teachers about the competency of their students on the First Steps indicators suggests that the indicators are grouped into the appropriate phases of the First Steps Writing continuum and so validly depict the development of children. Further, the key indicators are generally correctly located within these phases and consequently are reliable guides for placing children into developmental phases.

5. Validation of the Spelling continuum

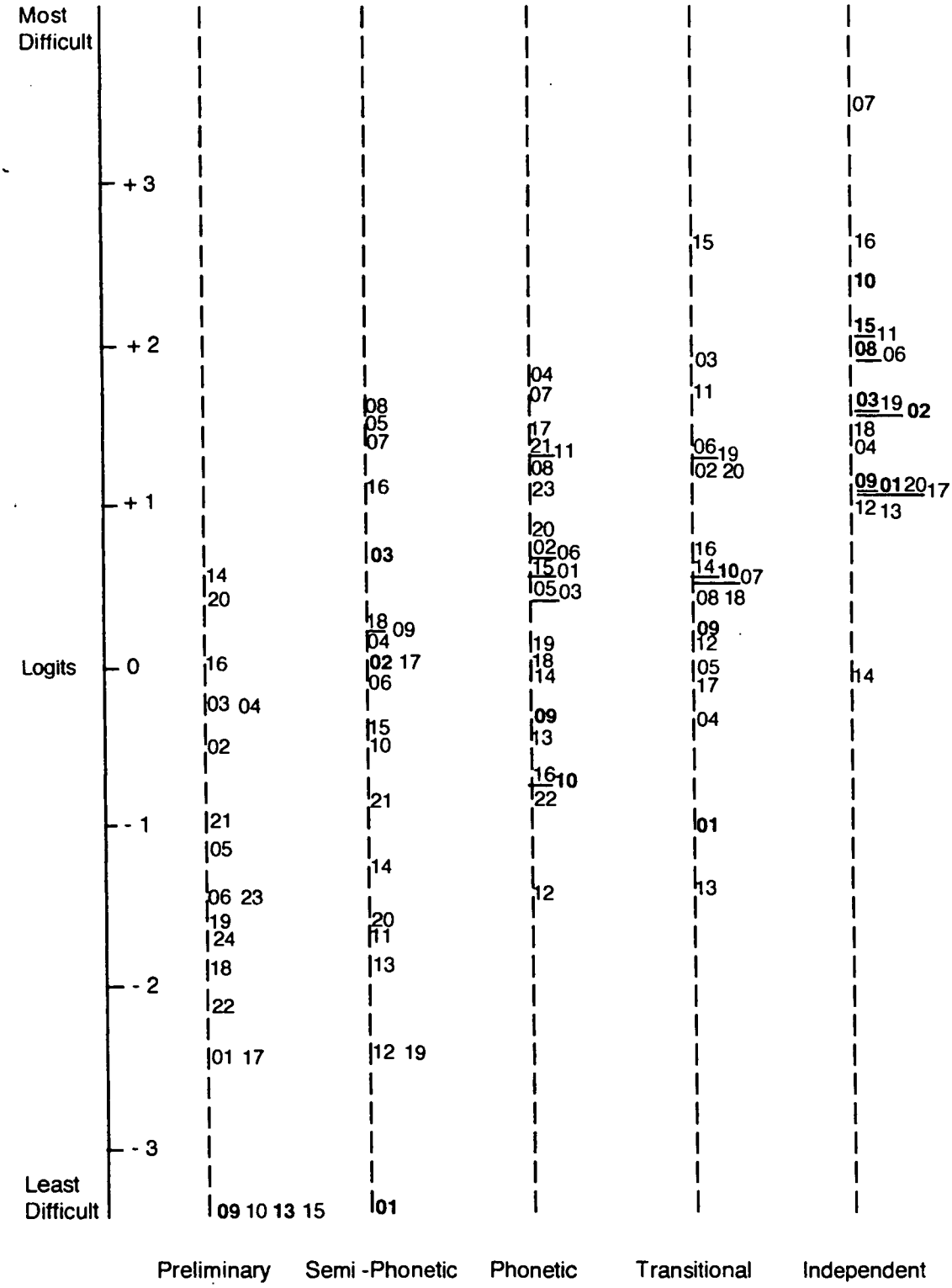
The same strategies are used to examine the Spelling continuum as were used to examine the Writing continuum. Note, however, that few of the explanations of the methods and of the graphical displays given as part of the analysis of the Writing continuum, are repeated here.

Exhibit 15 shows the distribution of the indicators along the difficulty scale within phases of the Spelling continuum. The analysis of the data required four indicators to be omitted because all students demonstrated competency in these indicators. These four indicators all came from the Role Play phase. Of the four indicators excluded from the Preliminary phase, two were key indicators.[16] One indicator from the Independent phase was omitted due to errors in the data caused by a fault in the computer program used to collect the data.[17]

[16]A claim could be made that if all children had mastered these two excluded key indicators then there is little point in using them. It needs to be remembered, however, that the data were collected late in the year. The children had had 9 months of schooling in which to achieve these competencies by the time the data were collected. A data collection earlier in the year could be used to establish the usefulness of these 2 indicators.

[17]The fault meant that teachers were unable to make judgements using this indicator. A blank screen appeared instead of the indicator. No valid data could therefore be collected. In the context of the evaluation, this error should be regarded as minor.

Exhibit 15: Estimated difficulty of First Steps indicators from the Spelling Continuum within phases of development.



The following indicators have been omitted from the analysis:

07	Preliminary Phase
08	Preliminary Phase
11	Preliminary Phase
12	Preliminary Phase
05	Independent Phase

Indicators 07 and 08 Preliminary Phase are key indicators. See Appendix A for codes.

Key indicators are marked in bold.

The data in Exhibit 15 are shown in simpler form in Exhibit 16. This exhibit shows that by using the range as a measure of spread that there can be seen a gradual trend of increasing difficulty with each successive developmental phase. It also appears, however, that the Phonetic and Transitional phases cause a 'flattening' out of this trend. These two phases seem not to be as difficult as might have been expected.

Exhibit 16: Difficulty estimates of indicators within phases of the Spelling Continuum.

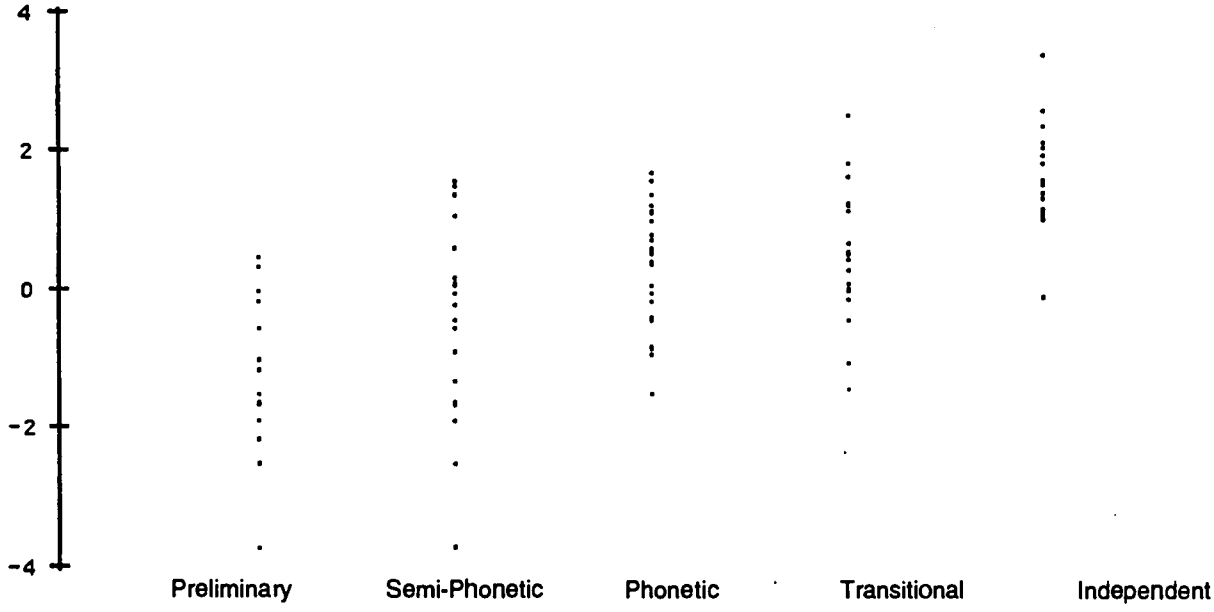
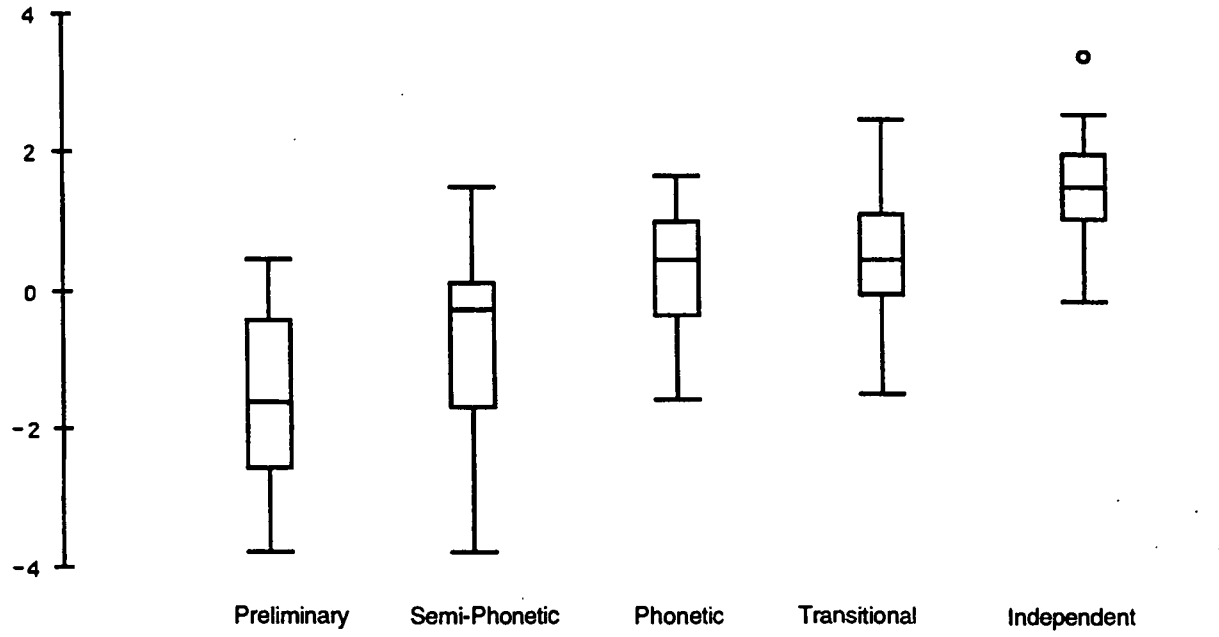


Exhibit 17: Box Plots of difficulty estimates of indicators within phases of the Spelling continuum



A more systematic examination of the location and the spread of the data shows that it is the Transitional phase which causes the 'flattening' out of the trend observed in Exhibit 16. This can be seen in Exhibit 17.

The locations of the medians of each of the first three phases rise progressively along the difficulty scale in the expected direction. The location of the median of the Transitional phase is, however, below that of the preceding Phonetic phase. This suggests that, on average, the indicators in the Transitional phase are easier than those of the Phonetic phase. Put another way, these data suggest that it is more difficult to move into the earlier Phonetic phase on average than it is for a child to move into the developmentally later Transitional phase. This finding suggests that the Transitional phase indicators of the Spelling continuum may need to be more closely examined.

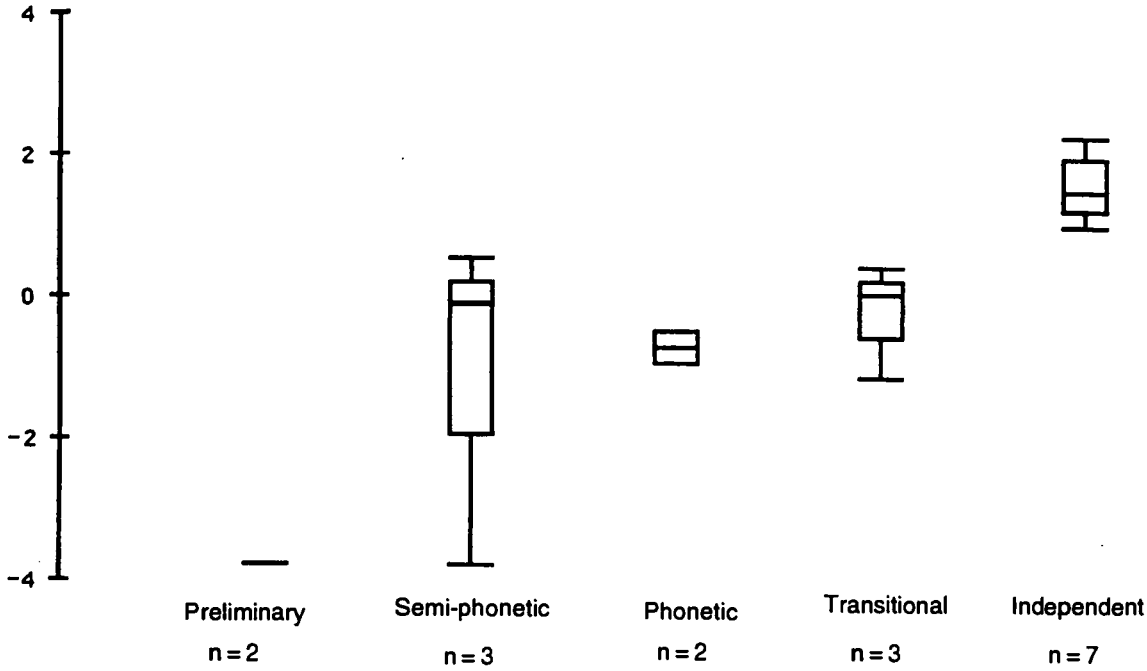
Generally the spread of indicators within each of the phases is about the same although it is somewhat larger for the Preliminary and the Semi-phonetic phases than for the other three phases. It should also be remembered that the spread of the Preliminary phase is probably underestimated in Exhibit 17 because of the four indicators from this phase which were excluded from the analysis.

There is considerable overlap between the Preliminary and the Semi-phonetic phases. There might not be so much overlap between these phases if the estimates of difficulty of the excluded indicators were known.[18] There is also considerable overlap between the Phonetic and the Transitional phases. This suggests that the placement of many of the indicators in one or both of these two phases may need to be examined.

It is, however, the overlap between phases for the key indicators which is critical for testing the validity of a continuum. It is critical because it is the key indicators that are used to locate children on a continuum. Exhibit 18 shows the spread of difficulty for the key indicators within each phase of the Spelling continuum. Again, it should be noted that the small number of key indicators in some phases and the omission of two key indicators from the Preliminary phase limits the examination of the spread of the key indicators. Nevertheless, there is still some useful information here.

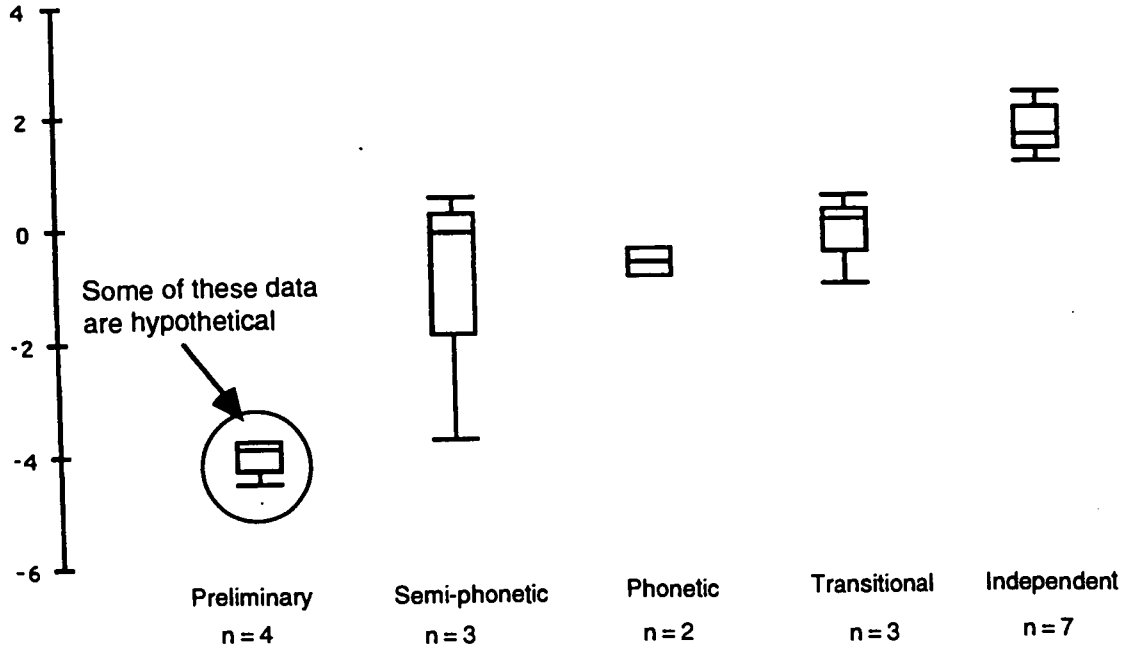
[18]The effect of including the excluded indicators would be to lower both the median and the location of the box in the box plot.

Exhibit 18: Box plots of the difficulty estimates of key indicators within phases of the Spelling Continuum.



The spread of indicators in the Semi-phonetic phase is wide. This spread extends across the range of the Phonetic phase and the Transitional phase. There is thus total overlap of these phases by the Semi-phonetic phase. The wide range of the Semi-phonic phase occurs because of the low estimated difficulty of one indicator (Code number 01) which has a value of less than -3. However, if this indicator is treated as an outlier and removed then the remaining key indicators within the Semi-phonetic phase are located higher on the difficulty scale than the key indicators of the adjoining more advanced Phonetic phase. To explore this problem further Exhibit 19 was prepared. Exhibit 19 contains the same data as that used to construct Exhibit 18 except that two additional hypothetical values have been added to represent the values of the excluded key indicators from the Preliminary phase. These values were given the hypothetical estimates of -4.0 and -4.5. These estimates were chosen because they are not excessively below the two known indicators. (The excluded key indicators were not estimated because every student demonstrated competence in them. These indicators can therefore be treated as being easier than the two known key indicators of the Semi-phonic phase. For this reason they were given low hypothetical estimates.) Allocating these hypothetical estimates gives a better view of the trend in the data and shows how the spread of key indicator estimates in the Semi-phonetic phase fits into this trend.

Exhibit 19: Box plots of the difficulty estimates of key indicators within phases of the Spelling continuum using two additional hypothetical values in the Preliminary phase to represent data that were excluded from the analysis because all students demonstrated competency in them.



An examination of Exhibit 19 shows that there is a clear trend of rising difficulty across the graph for each of the phases. The exceptions are the key indicators in the Semi-phonetic phase which are too high. Once this is seen it becomes clear that it is the two highest estimates in this phase (for the indicators with the code numbers 02 and 03) which are causing a problem. It is, therefore, probably best to not treat the lowest level key indicator in the Semi-phonetic phase as being in an aberrant location. It is probably better to regard the other two key indicators as being inappropriately located within this phase. If this is done and less difficult indicators are defined as 'key' in the Semi-phonetic phase then a good approximation to the ideal model emerges. That is, there will be less over lap between the Semi-phonetic and the Phonetic phases. There will also be a reduction in the present wide gap between the key indicators of the Preliminary and the Semi-phonetic phases.

There is little or no overlap in the spread o the key indicators in the Phonetic, Transitional and Independent phases. There is a small gap between the Transitional phase and the Independent phase.

In summary then, it can be said that generally the groups of indicators within phases of the Spelling continuum are ordered along the difficulty scale in ways which are broadly consistent with the ideal model. Two notable problems are identified, however. First, the indicators

within the Transitional phase are not, on average, more difficult than the indicators in the preceding Phonetic phase. Secondly the key indicators in the Semi-phonetic phase are more difficult than the key indicators in the following Phonetic phase. These two problems need to be addressed if the Spelling continuum is to better match the ideal model of a developmental continuum segmented into phases and so be of use to teachers.

Finally, it should be noted that where there are large overlaps between phases or where a developmentally later phase is on average less difficult than an earlier phase (as happens with the Transitional Spelling phase) there are a number of possible reasons. Some of these reasons include:

Some indicators have been placed in the wrong phase by First Steps. By moving the incorrectly located indicators into the correct phase the problems of overlap and of incorrect sequencing of the phases will be remedied.

Some indicators are imprecisely worded leading teachers to have differing interpretations of them. If the wording of these indicators is changed to clarify their meaning and if the validation is repeated, then the indicators would be more precisely located.

Some examples, which form part of the wording of an indicator may be misleading. Consider the indicator "The child chooses letters on the basis of sounds, eg vampia (vampire), pepl (people)". The wording "The child chooses letters on the basis of sounds" may be perfectly clear but the examples following may be inconsistent with this meaning. The effect of these examples may be to distract the teacher from the intended meaning. A review of the effect of the examples on the interpretation of the meaning of an indicator could lead to a more precise interpretation of the indicator by teachers.

Some phases are intrinsically difficult to discriminate between. It may be the case that the differences between two phases are both real and consequential but also subtle and difficult to detect. In this case teachers' interpretations will be inconsistent when attempting to distinguish between phases.

Children can sometimes regress in their development from one phase to an earlier phase. There is some anecdotal evidence (supplied by First Steps personnel) that children may sometimes move back from a later phase to an earlier phase. In particular, it was claimed that children seem to move back and forth a number of times between the Phonetic and Transitional spelling phases. The reasons for this are not clear. However,

if this indeed occurs, it is possible that when the data were collected for the validation of the continua some of the children were in this state of regression. If they were, then it is possible that they exhibited competency on many of the indicators in the Transitional phase but had lost their competency on some of the earlier Phonetic phase indicators. (That is, they were moving back to recover a lost competency.) This would explain the finding that, on average, Transitional indicators were found to be less difficult than indicators from the earlier Phonetic phase. It should also be noted, however, that if this is the case, then the usefulness of the distinction between the two phases is brought into question.

Pedagogical practices discourage children from following the development depicted in the continua. There is some anecdotal evidence (again supplied by First Steps personnel) that the large overlap in the spread between the key indicators of the Semi-phonetic and the Phonetic phases may have occurred because of the impact of some teaching strategies used by some teachers. These strategies are intended to have children adopt standard spelling before they have been able to learn spelling strategies other than those based on phonics. It was claimed by First Steps personnel that this particularly occurs if children are discouraged from taking risks in their spelling. These children will tend to resort to copying words, asking someone else to spell a word for them or only using words that they know. In this case, the child will be encouraged to 'jump' a developmental phase. (They will seem to go from the Preliminary to the Phonetic phase.) If pedagogical practices can effect the development of children between the Semi-phonetic and the Phonetic phases of the Spelling continuum it is possible that other pedagogical practices could effect the relationship between other phases.

Each of these factors may alone or in conjunction effect the location of indicators along the scale of difficulty.

How 'key' are the key indicators?

Every phase of a First Steps continuum has some indicators defined as 'key'. These indicators are used to allocate children to a phase of development. They were defined as 'key' by First Steps using in-house research done by First Steps personnel and from advice taken by the users of First Steps.

The aim of this section is to examine how 'key' these 'key indicators' are. First, however, an introduction is given to the method by which the 'keyness' of the key indicators is estimated.

Earlier, a First Steps continuum was likened to a path along which indicators are placed to act like milestones or sign posts. These milestones tell the teacher where the child is at in their development. So far, the analysis has been concerned with locating where these milestones are along the length of the path. The next task might be likened to establishing how close the milestones are placed to this path. If the milestones are close to the path then their message is clear and unambiguous about a child's location on the path. Such indicators would be good candidates for being defined as key indicators. The further from the path the milestones lie, the more indistinct and ambiguous becomes their message. If they lie a long way from the path it may not be clear that they refer to this path at all but to another.

This analogy using milestones and paths needs to be treated cautiously for, like all analogies, it is limited. A more precise description of the approach used is needed. A First Steps continuum can be treated as a variable. This variable, when measured can be construed as tapping an underlying 'trait' named, say, 'Writing literacy" (in the case of the Writing continuum). Once conceived this way, the Rasch modelling technique can be used to provide an estimate of the extent to which any one indicator is consistent with this underlying variable. If a 'key indicator' is defined as an indicator which is strongly consistent with the underlying variable, then the Rasch modelling technique can be used to estimate how 'key' the key indicators of a First Steps continuum are. It can also show which of those indicators that are currently not defined as 'key', might be good candidates for being defined as such if changes are required.

The measure used to estimate the consistency of an indicator with the underlying variable is called the 'Infit Mean Square'. Exhibit 20 shows values of the Infit Mean Square for each of the indicators from the Writing continuum. The scale has been divided into three zones. There is a left hand zone, an adjoining central zone which has a column of dots marking its boundaries and an adjoining right hand zone. Although the locations of these zones are somewhat arbitrary they are based upon practical experience with this technique.[19]

[19]Given the use of the 'path' as an analogy for a First Steps continuum throughout this report it is probably important to note that the central column in Exhibit 20 ought not to be regarded as representing a path.

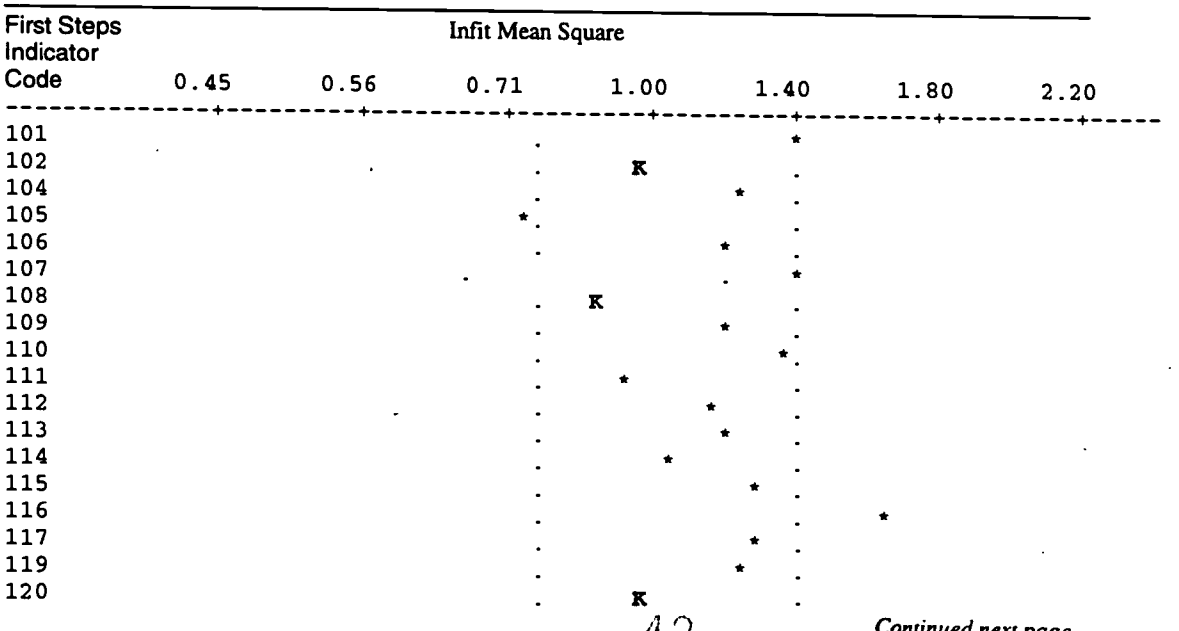
An indicator with a value falling inside the central zone is measuring the underlying variable to a satisfactory extent. In Exhibit 20 an example of one such indicator is the First Steps indicator coded with the number 121.

An indicator with a value in the right hand zone (that is with a Mean Square value of about 1.4 or more) has a less than ideal correlation with the other indicators developed for this continuum (that is, students with high levels of competence - as reflected in their achievements of other indicators--do not perform as well as expected on this indicator, and students with low levels of competence perform better than expected). Indicator 216 in Exhibit 20 is an example.

Indicators with Infit Mean Square values in the left hand zone of Exhibit 20 are strongly correlated with the developmental dimension being defined by the full set of indicators. These indicators can be regarded as candidates for being defined as 'key indicators'. Indicator 222 in Exhibit 20 is an example of one such indicator.

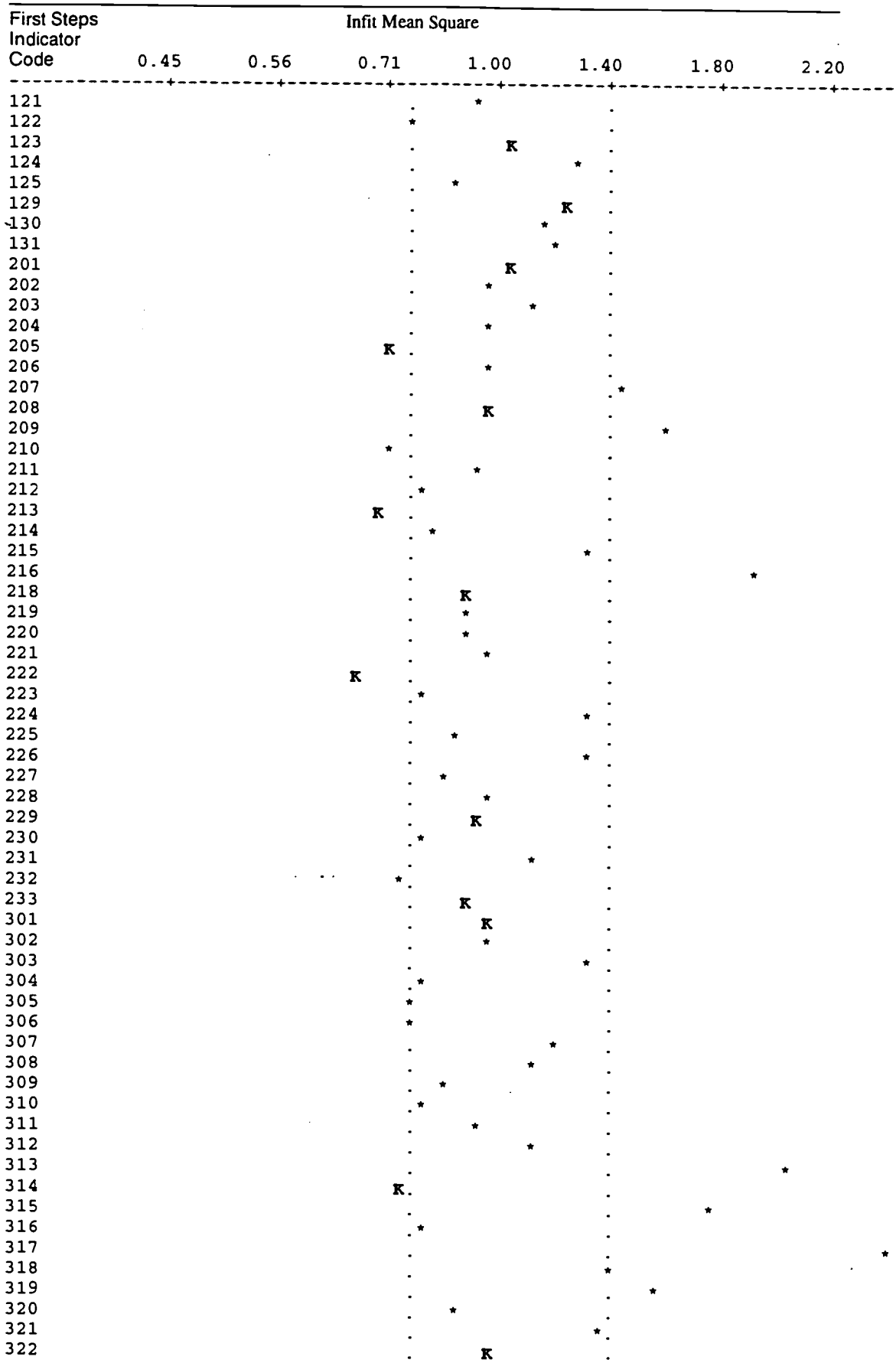
In Exhibit 20 the letter 'K' in the body of the table marks the location of each of the key indicators of the Writing continuum. The location of all other indicators are marked using an aster '*'. The first column lists the code number of each of the indicators in the Writing continuum that were included in the analysis. Appendix A provides the link between these code numbers and the text of the indicators. It might be useful, however, to note here that the first digit of the code number identifies the phase of the indicator. Thus the digit '1' in this location means the first or the 'Role Play phase' and '2' means the 'Experimental phase' and so on.

Exhibit 20: Item fit of First Steps Writing continuum indicators.



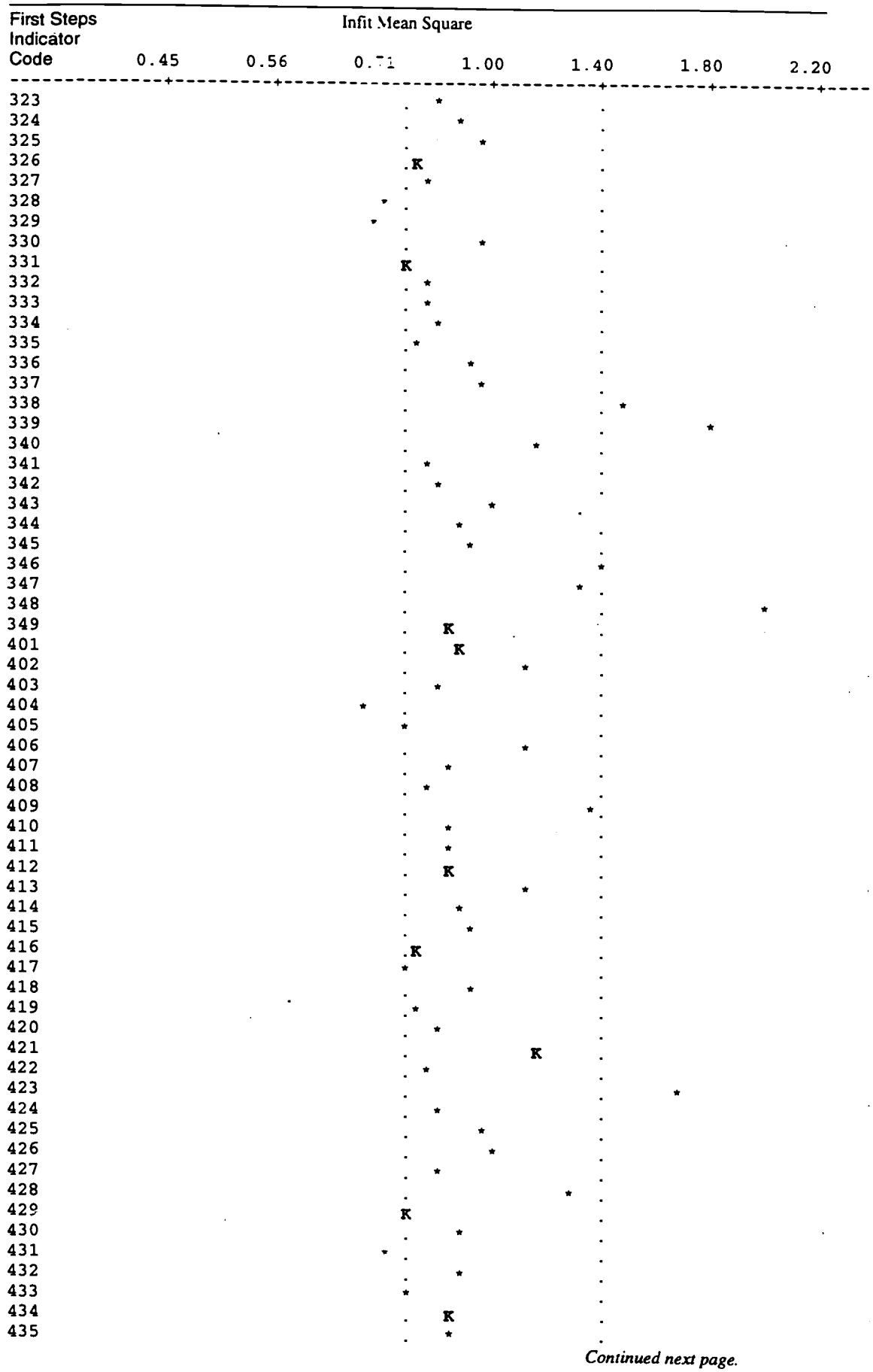
Continued next page.

Exhibit 20: Item fit of First Steps Writing continuum indicators. *(Continued)*



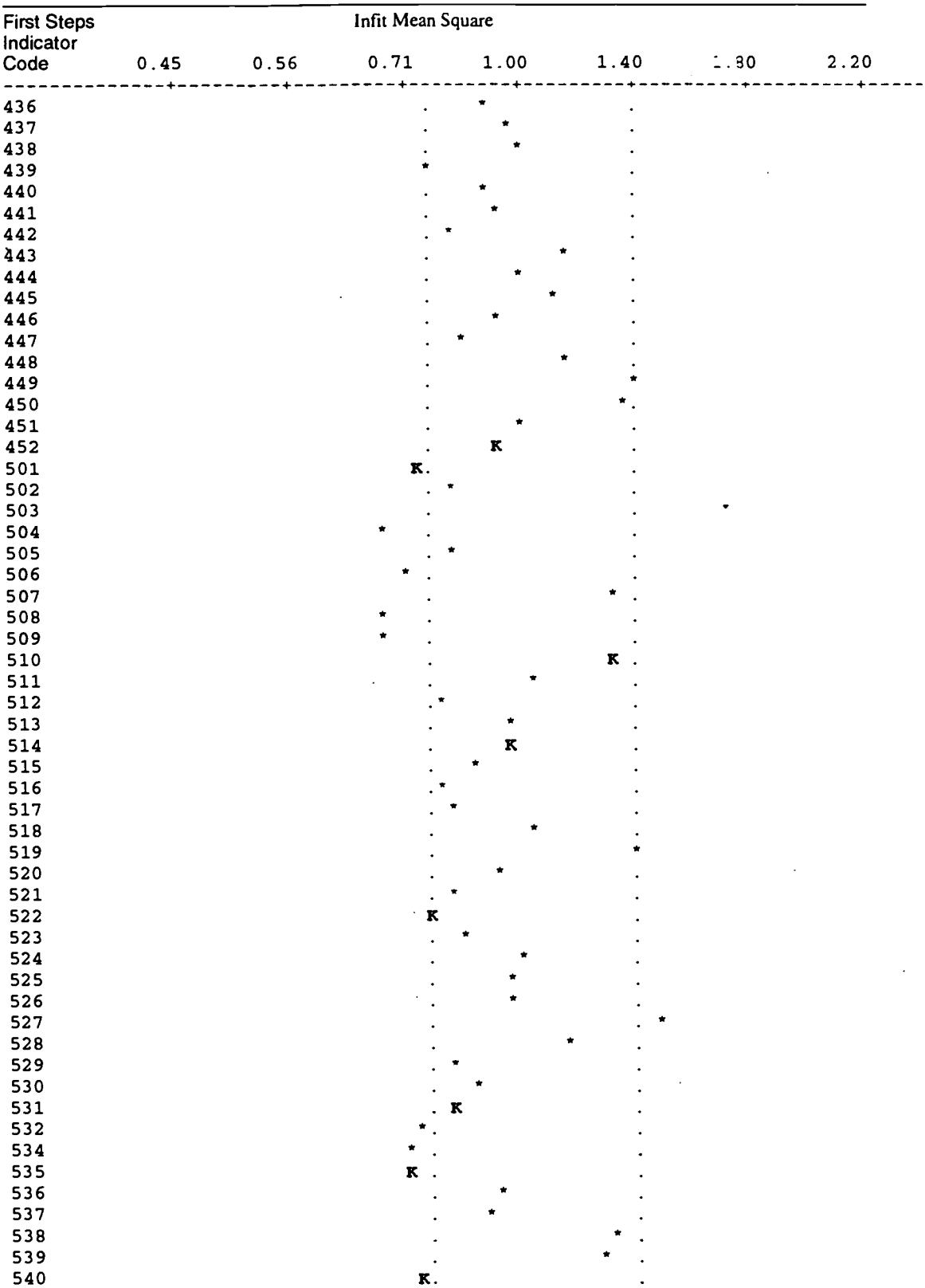
Continued over page.

Exhibit 20: Item fit of First Steps Writing continuum indicators. *(Continued)*



Continued next page.

Exhibit 20: Item fit of First Steps Writing continuum indicators. *(Continued)*



An examination of Exhibit 20 shows that all key indicators in the Writing continuum fall within the central zone or the left hand zone. All key indicators can thus be considered as being

consistent with the concept that underlies or defines this continuum, namely 'Writing literacy'. In the vernacular - the key indicators all 'hang together well'.

Those indicators which are currently not defined as key but which might be considered as candidates for being defined as key, on the basis of these data, are as follows:

Phase	Indicator code
Role Play	105
Experimental	210, 232
Early Writing	328, 329
Conventional	404, 431
Advanced	504, 506, 508, 509, 532, 534.

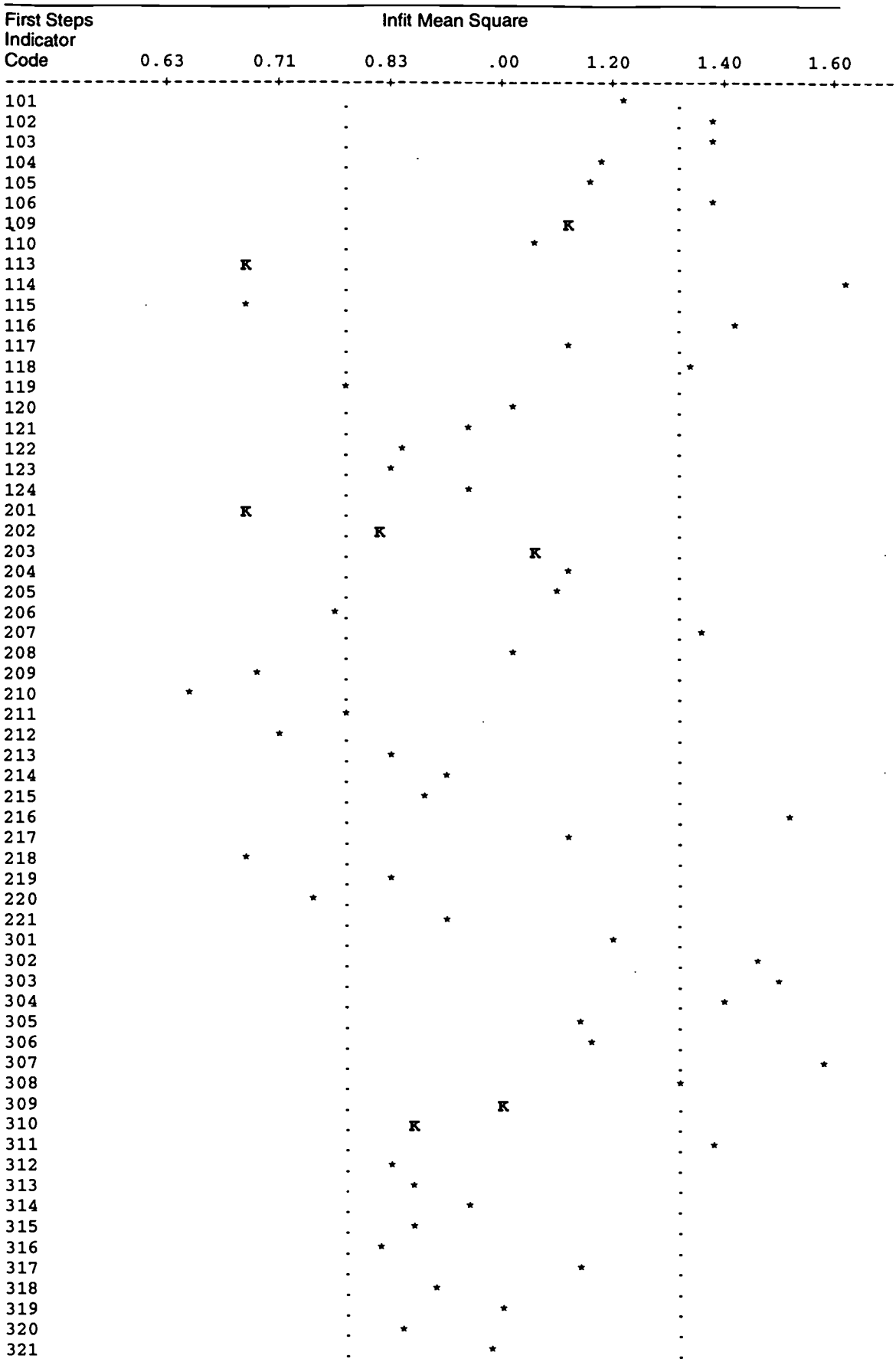
The following indicators from the Writing continuum which are identified as having a relatively low correlation with the majority of the indicators are:

Phase	Indicator code
Role Play	107, 116,
Experimental	207, 209, 216
Early Writing	313, 315, 317, 319, 338, 339, 348
Conventional	423
Advanced	503, 527

These outlying indicators might usefully be examined to make their interpretation by teachers more consistent. Alternatively, some might be considered for exclusion from the continuum because, on these data, they are not contributing, as best they ought, to the allocation of children to a place on the developmental Writing continuum.

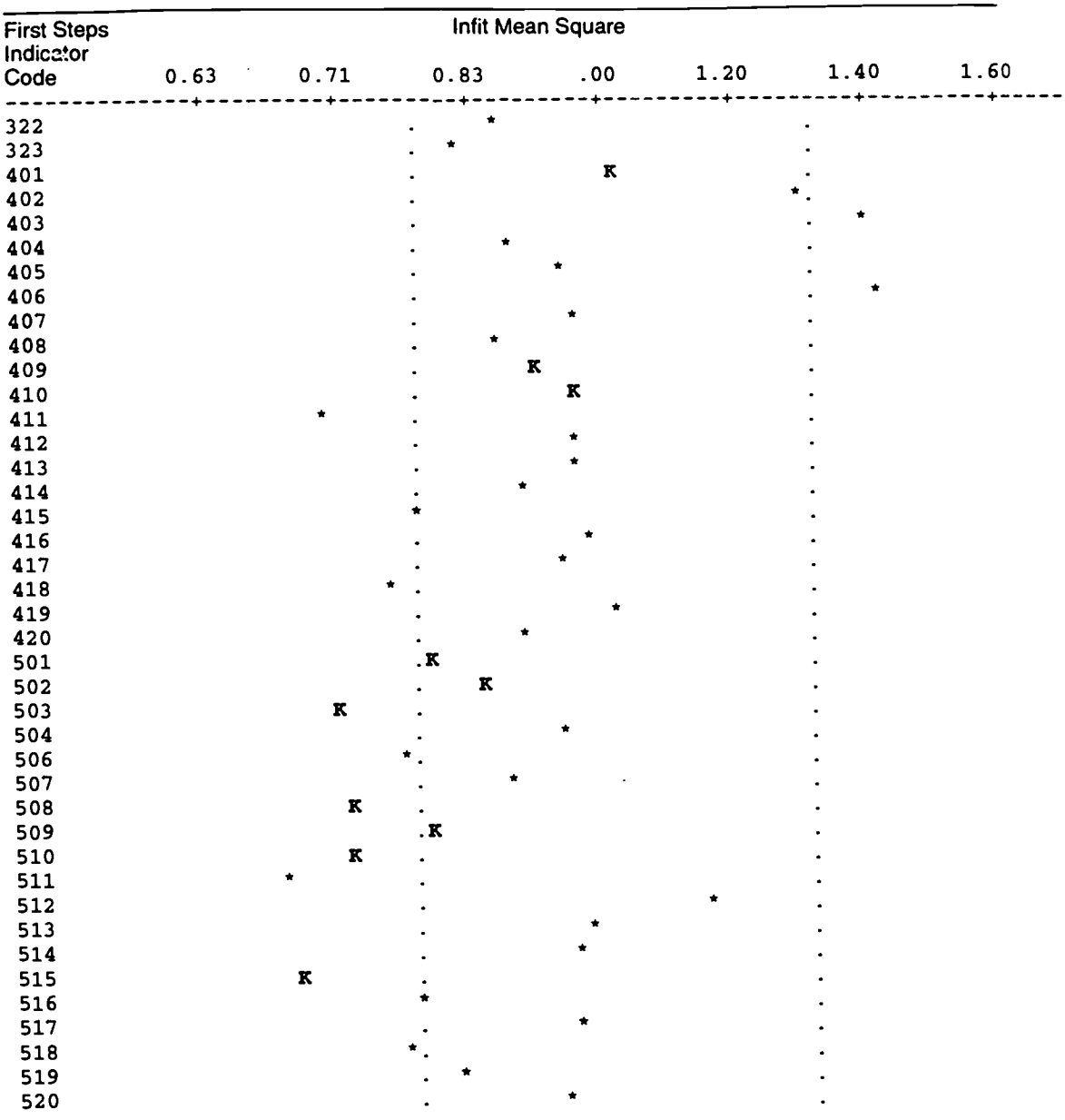
The keyedness of the key indicators from each of the phases within the Spelling continuum is now examined. Exhibit 21 shows the Infit Mean Square for each of these indicators.

Exhibit 21: Item fit of First Steps Spelling continuum indicators.



Continued over page.

Exhibit 21: Item fit of First Steps Spelling continuum indicators. *(Continued)*



An examination of Exhibit 21 shows that all key indicators in the Spelling continuum fall within the central or the left hand zones. All key indicators can thus be considered to be consistent with the concept underlying of 'Spelling literacy'. As with the Writing continuum, the key indicators 'hang together well'.

Those indicators which are currently not defined as key but which might be considered as candidates for being defined as such, using these data, are as follows:

Phase	Indicator code
Preliminary	115
Semi-phonetic	209, 210, 212, 218, 220
Phonetic	nil
Transitional	411, 418
Independent	506, 511, 518,

The following indicators from the Spelling continuum identified as having a relatively low correlation with the majority of the indicators are:

Phase	Indicator code
Preliminary	102, 103, 106, 114, 116, 118
Semi-phonetic	207, 216,
Phonetic	302, 303, 304, 307, 311
Transitional	403 406
Independent	nil

These outlying indicators might be examined to make their interpretation by teachers more consistent. Alternatively some might be considered for exclusion from the continuum because, on these data, they are not contributing as well as might be hoped to the allocation of children to a place on the Spelling continuum.

In summary, all key indicators for both the Spelling and Writing continua can properly be regarded as being consistent with the underlying variable within each of these continua.

There are 15 indicators in the Writing continuum which could be considered for either (1) revision of their wording or (2) removal from the continuum because, on the data used here, they are not consistent or strongly consistent with the continua of which they have been defined as part. There are also 15 indicators in the Spelling continuum which might be reviewed for the same reasons. Generally however, most indicators (about 90% of the Writing continuum's indicators and about 85% of the indicators from the Spelling continuum) are strongly consistent or consistent with the continua of which they are part.

PART 2: THE RESPONSE OF CLASSROOM TEACHERS TO THE FIRST STEPS CONTINUA

In this section of the report the views held by Year 1 and Year 5 classroom teachers about the usefulness and the validity of the First Steps continua are examined. These views are taken from responses made in questionnaires sent to selected schools in August 1992. The empirical validation of the continua in the first section of this report examined only the Spelling and Writing continua. In this section, because teachers were asked about the five First Steps continua, all are considered.

The responses from classroom teachers are taken from 16 randomly selected schools. The sample was stratified along two dimensions. These were school disadvantage status (PSP versus non PSP) and length of time involved with First Steps (Old versus New First Steps)[20] Schools were selected with a probability proportional to their size.[21]

Examination of some survey data about the First Steps continua from classroom teachers.

Before examining how the continua are used and how valid they are perceived to be by teachers, it is important to know how widely the continua are used. If few teachers use them then it is largely irrelevant how useful and valid they are.

Year 1 and Year 5 teachers were asked which continua they had used with their current class in 1992. (The question was worded so that any use, no matter how marginal to the teachers' practice in the classroom would count as usage.)[22] The data show that the continua are widely used in classrooms. Exhibit 22 shows that 5 (11%) of Year 1 and Year 5 classroom teachers report using no continua. A little over 80% of teachers use two or more continua.

Exhibit 22: Number and percentage of Year 1 and Year 5 teachers using First Steps continua

Number of Continua	0	1	2	3	4	5	Total
Number of Teachers	5	3	16	11	9	1	45
Percentage of Teachers	11	7	36	24	20	2	100

[20] An old First Steps school was one defined as having a formal involvement with the program for more than one year. New First Steps schools had a formal involvement of less than one year with the program.

[21] See the report *The Impact of First Steps on the Reading and Writing ability of Western Australian Year 5 students.* for a fuller description of the sampling.

[22] See Appendix D for the questions asked in the questionnaires.

The analysis of the data displayed in Exhibit 22 was extended to see if there were any relationships between school type (old or new First Steps) and PSP status. The distribution of responses along these dimensions is displayed in Exhibit 23.

Exhibit 23: Number and percentage of Year 1 and Year 5 teachers using different numbers of First Steps continua by school type

School Type	Number of continua used 0	1	2	3	4	5	Total
New FS non PSP	0	1	4	4	1	0	10
New FS PSP	0	0	4	2	2	0	8
Old FS non PSP	1	0	4	3	6	0	14
Old FS PSP	4	2	4	2	0	1	13
Total	5	3	16	11	9	1	45
Percentage	11%	7%	36%	24%	20%	2%	100%

[Likelihood ratio $\chi^2 = 24.707$ with 15 df is not significant.]

An examination of the difference between the observed frequencies in each cell and the expected frequencies in each cell (based on the proportions in the row and column marginal totals) in Exhibit 23 shows that there is no significant difference between them. However, this decision was based upon a measure very close to significant. ($P < 0.054$) Thus, while formally, school type does not seem to effect the number of continua used by teachers, it is interesting that of the 8 teachers using 0 or 1 continua, 7 come from old First Steps schools and of these 7, 6 come from old First Steps PSP schools. (Further examination of these teachers' responses showed that 4 of the 6 teachers came from the same school.) This is weak evidence that there is a drift away from using First Steps continua in old First Steps PSP schools. However, an examination of the judgement of these teachers from old First Steps PSP schools about the success of the program in their school shows that 7 of these 8 teachers regard First Steps as a success in their school. This suggests that if there is a drift, and it is not clear that there is one, from the use of First Steps continua in these schools it is not because teachers see the program as a failure. Alternatively, First Steps may have become such an integrated part of their behaviour that they no longer recognise that they are using First Steps information.

While the continua are widely used in schools, results from the survey showed that some were more commonly used than others. Exhibit 24 shows how frequently different continua were used by Year 1 and Year 5 classroom teachers.

Exhibit 24: Number and percentage of Year 1 and Year 5 teachers using First Steps continua

	Writing Development	Writing Learning	Spelling	Reading	Oral Language
Number	33	13	33	21	9
Percentage	73	29	73	47	9

Many teachers reported using more than one continuum so double counting appears in Exhibit 24. An example will help to interpret Exhibit 24. Examine the number on the extreme left of the bottom row of the table. This shows that of all Year 1 and Year 5 teachers responding to this item in the survey, 73% used the Writing Development continuum in 1992.

Exhibit 24 thus shows that Writing and Spelling are the most commonly used continua with 73% of Year 1 and Year 5 teachers reporting that they had used them in 1992. The least commonly used is Oral Language with only 20% of all Year 1 and Year 5 teachers in the sample having used it in 1992). About half (47%) of all teachers were using the Reading continuum.

If all teachers are using the continua in approximately the same way then it can be concluded from the above that Year 1 and Year 5 classroom teachers are most frequently focusing on developing those skills required to get ideas onto paper (Spelling and Writing). Getting ideas off paper (Reading) is the next most frequently reported focus and the least commonly reported focus is teaching skills for communicating ideas orally.

Having established that teachers are generally familiar with First Steps continua it is now possible to consider to what extent they regard the continua as accurately depicting the development of skills in the students which they teach.

Teachers were asked in the survey to describe how well the continua which they had used depicted the development observed in their students. Their responses were coded into 3 broad categories. Exhibit 25 describes the frequencies in each of these categories.

Exhibit 25 shows that, irrespective of school type and PSP status, a large proportion of teachers (84% overall) report the continua as depicting the development they see in their students either very well or quite well. This is particularly clearly seen with teachers from old First Steps schools. All but one teacher from these schools (or 95% of them) report the continua as depicting very well or quite well the development of their students. New First Steps schools

are, not surprisingly, more likely to have teachers who regard it as too early to judge the adequacy of the continua.

Exhibit 25: Number and percentage of Year 1 and Year 5 teachers reporting how well the continua which they have used in 1992 depict the development of their students by school type.

School Type	Very or Quite Well	Poorly	Don't Know /Too Soon	Total
New First Steps non PSP	6	2	2	10
New First Steps PSP	7	0	1	8
Old First Steps non PSP	11	1	0	12
Old First Steps PSP	8	0	0	8
Total	32(84%)	3(8%)	3(8%)	38(100%)

($\chi^2 = 7.28$ with 6 df is not significant.]

These data show that, generally, so far as classroom teachers are concerned, the continua accurately depict the development of literacy skills in Year 1 and Year 5 students. This confirms the general thrust of the findings from the empirical validation of the Spelling and Writing continua reported earlier.

BIBLIOGRAPHY:

Adams, R. and Khoo, S. — Quest, Hawthorn, Victoria, ACER, 1992.

Mossenson, L., Hill, P. and Masters, G. — TORCH test of reading comprehension manual, Hawthorn Victoria, ACER, 1987.

Western Australian Ministry of Education — Writing Developmental Continuum,, Perth, 1992.

Wright, B. and Stone, M. — Best Test Design, Chicago, Mesa Press, 1979

APPENDIX A:

Code numbers for the First Steps Spelling and Writing indicators

For ease of use and to avoid cluttered graphical displays indicators were allocated codes. The codes and the indicators are listed below.

The first digit identifies the phase from which the indicator comes. The second and third digits identify the indicators. Phases and indicators were numbered in the same order given in the First Steps publications *Spelling Developmental Continuum* (1991) and *Writing Developmental Continuum* (1991). The fourth character of the code indicates the response set available to teachers when they were entering the data. For those indicators with the code 'B' the teachers had the 'Yes'/'No'/'Beyond' categories and for the code 'Y' they had the 'Yes'/'No' categories.

Spelling Indicator Codes

1. Preliminary Phase

101 B
draws symbols that resemble letters using straight, curved, intersecting lines

102 B
uses a combination of pictorial and letter representations

103 B
places letters randomly on a page

104 B
mixes letters, numerals and invented letter shapes

105 B
repeats some known alphabet symbols (often uses letters from own name)

106 B
writes random strings of letters

107 B
uses writing-like symbols to represent written language

108 B
uses known letters or approximations of letters to represent written language

109 B
assigns a message to own symbols

110 B
shows beginning awareness of directionality

111 Y
knows that writing and drawing are different

112 Y
knows that a word can be written down

113 Y
is aware that print carries a message

114 B
may read own writing differently at each reading

115 Y
recognises own name or part of it, (e.g. 'That letter is in my name.')

116 B
writes the first letter of name correctly and finishes the word with a random string of letters

117 Y
writes own name correctly

118 B
names or labels own writing and pictures using a variety of symbols

119 Y
reacts to environmental print

120 Y
is willing to 'have a go' at representing speech in print form

121 B
experiments with writing-like forms

122 Y
talks about what has been drawn, written

123 Y
asks questions about printed words and messages

124 Y
is keen to share written language discoveries with others

2. Semi phonetic Phase

201 Y
uses left to right and top to bottom orientation of print

202 B
relies heavily on the most obvious sounds in a word, e.g. KT (kitten) WT (went) BE (baby)

203 B
represents a whole word with one, two or three letters. Uses mainly consonants, e.g. KGR (kangaroo) BT (bit)

204 B
uses an initial letter to represent most words in a sentence, e.g. s o i s g t o c a s (Someone is going to climb a slide.)

205 B
uses letter names to represent sounds, syllables or words e.g. AT (eighty)

206 B
uses a combination of consonants with a vowel related to a letter name, e.g. GAM (game), MI (my)

Semi-phonetic Phase Spelling Continuum (Continued.)

207 Y
uses more letters for longer words

208 B
writes one or two letters for sounds then adds random letters to complete the word, e.g. crecuea (creature)

209 B
begins to use some simple common letter patterns, e.g. th (the), bck (bike)

210 B
uses a small bank of known sight words correctly

211 B
recognises some sound-symbol relationships in context, e.g. points to 'ship' and says 'sh' or recognises first letter of name

212 B
recognises some words in context, e.g. 'That word says "dog".'

213 Y
recognises rhyming words

214 Y
recognises and copies words in the environment

215 B
begins to leave spaces between word-like letter clusters, e.g. I h bn sik (I have been sick.)

216 B
confuses words with objects they represent, e.g. 'Train is a long word because trains are long, caterpillar is a little word because...'

217 Y
is willing to have a go at representing speech in a print form

218 Y
is confident to experiment with words

219 Y
talks about what has been drawn, written

220 Y
seeks response by questioning

221 Y
is keen to share written language discoveries with others

3. Phonetic Phase

301 B
chooses letters on the basis of sound without regard for conventional spelling patterns, e.g. kaj (cage), tabl (table), birgla (burglar)

302 B
develops particular spellings for certain sounds often using self-formulated rules, e.g. becoz (because), woz (was)

303 B
substitutes incorrect letters for those with similar pronunciation, e.g. oshan (ocean), nacher (nature)

304 B
adds an incorrect vowel after a correct vowel or consonant, e.g. hait (hat), derum (drum), miu (my), fien (fine)

305 B
represents past tense in different ways according to the sounds heard, e.g. stopt (stopped), watcht (watched), livd (lived)

306 B
uses the letter 'r' to represent a syllable, e.g. watr (water), mothr (mother)

307 B
confuses short vowel sounds, e.g. pell (pill)

308 B
sometimes omits one letter of a two letter blend or digraph, e.g. fog (frog), mik (milk), leve (leave)

309 B
chooses letters on the basis of sound, e.g. vampia (vampire), pepl (people)

310 B
represents all the essential sounds of a word, e.g. spidr (spider), kitn (kitten), wacht (watched)

311 B
still uses some letter name strategies, e.g. awa (away), exellnt (excellent)

312 Y
usually spells commonly used sight words correctly, e.g. in, has, his, he, my

313 B
uses some known patterns in words, e.g. mathursday (mothers' day), nght (night)

314 B
is beginning to use syllabification for spelling longer words, e.g. telefon (telephone), butufl (beautiful). Some syllables may be omitted.

315 Y
shows increased influence of spelling words encountered in books

316 Y
identifies similar sounding words

317 B
is beginning to use simple homonyms/homophones correctly, e.g. their/there, one/won, for/four, two/too/to, park, nail

318 Y
continues to 'have-a-go'—experimenting with spelling words in different ways

319 Y
is willing to 'have a go' at representing speech in print form

320 Y
sees self positively as a writer - speller

321 Y
confidently makes decisions

322 Y
is willing to spell on his/her own

323 Y
uses word sources confidently

4. Transitional Phase

401 B
uses common English letter sequences, when attempting to spell unknown words, e.g. thousend (thousand), cort (caught), doller (dollar)

402 B
uses vowel digraphs liberally - may be unsure of correct usage, e.g. plaiyed, kaingarows, rane

403 B
uses silent 'e' as an alternative for spelling long vowel sounds—may be over-generalised, e.g. mite (might), biye (buy)

404 Y
correctly inserts a vowel before the 'r' at the end of a word, e.g. 'brother' instead of 'brothr'; 'water' instead of 'watr'

405 Y
spells inflectional endings such as '-s', '-ing', '-est', conventionally

406 B
includes all the correct letters but may sequence them incorrectly: yuo (you), shose (shoes)

407 B
beginning to make spelling generalisations (uses some double letters correctly)

408 Y
is able to proof read known bank of words

409 B
uses letters to represent all vowel and consonant sounds in a word, placing vowels in every syllable, e.g holaday (holiday), gramous (grandma's), honeted (hunted)

410 B
is beginning to use visual strategies, such as knowledge of common letter patterns and critical features of words, e.g silent letters, double letters

411 B
is beginning to use knowledge of word meanings, e.g. sign - signature, medicine - medical, useually (usually)

412 B
usually represents all syllables when spelling a word, e.g. uncontrollablely (uncontrollably)

413 Y
has a bank of known words that are used in writing

414 B
is beginning to use knowledge of word parts, e.g. prefixes, suffixes, compound words

415 Y
uses more difficult homonyms/homophones correctly, e.g. sore/soar; pour/poor, board/bored

416 Y
is willing to take risks and responsibility

417 Y
is willing to 'have a go' at spelling difficult words, e.g. abitories (abattoir)

418 Y
is aware of social obligations as a speller

419 Y
is willing to use a range of resources

420 Y
has an interest in words and enjoys using them

5. Independent Phase

501 Y
is aware of the many patterns and rules that are characteristic of the English spelling system, e.g. common English letter patterns; relationship between meaning and spelling

502 Y
makes generalisations and is able to apply them to new situations, e.g. rules for adding suffixes, selection of appropriate letter patterns (-tion)

503 Y
has mastered accurate spelling of prefixes, suffixes, contractions, compound words

504 Y
uses context to distinguish homonyms and homophones

505 Y *(Note that no data were collected for this indicator owing to an error in the computer program.)*
uses silent letters and double consonants correctly

506 Y
continues to master words with uncommon spelling patterns and words with irregular spelling, e.g. eight, aisle, quay

507 Y
uses less common letter patterns correctly, e.g. weird, forfeit, cough, reign

508 Y
uses a multi-strategy approach to spelling (visual patterns, sound patterns, meaning)

509 Y
is able to recognise when a word doesn't look right and to think of alternative spellings

510 Y
analyses and checks work, editing, writing and correcting spelling

511 Y
recognises word origins and uses this information to make meaningful associations between words

512 Y
continues to experiment when writing new words

513 Y
uses spelling references (dictionaries, thesauruses, resource books) appropriately

514 B
uses syllabification when spelling new words, e.g. illeagle (illegal)

515 Y
has accumulated a large bank of known words (is using more sophisticated language)

516 Y
shows increased interest in the similarities, differences, relationships and origins of words

517 Y
is willing to take risks and responsibility - is aware of social obligations as a speller

518 Y
has a positive attitude towards self as a speller

519 Y
has an interest in words and enjoys using them

520 Y
is willing to use a range of resources

Turn over the page for the Writing continuum.

Writing Continua

1. Role Play Phase

101 Y
assigns a message to own symbols

102 Y
gives an oral account of direct experiences

103 B
knows some favourite parts of stories, rhymes, jingles or songs

104 B
reads text from memory or invents meaning (the meaning may change each time)

105 B
writes and ask others to assign meaning to what has been written

106 Y
talks about own drawing and writing

107 Y
dictates for adult to write

108 B
uses known letters or approximations of letters to represent written language

109 B
draws symbols consisting of straight, curved or intersecting lines that simulate letters

110 B
makes random marks on paper

111 B
produces aimless or circular scribble

112 B
makes horizontal or linear scribble with some breaks

113 B
places letters randomly on page

114 B
writes random strings of letters

115 B
mixes letters, numerals and invented letter shapes

116 B
experiments by 'flipping' or reversing letters

117 B
experiments with upper and lower case letters. May show a preference for upper case.

118 B
repeats a few known alphabet symbols frequently using letters from own name

119 B
copies print from environment

120 B
shows beginning awareness of directionality, i.e. points to where print begins

121 Y
makes organisational decisions about writing, e.g. 'I'll start here so it will fit.'

122 B
copies layout of some text forms, e.g. letters, lists

123 Y
is aware that print carries a message

124 B
role plays writing message for purpose, e.g. telephone messages

125 B
states purpose for own marks on paper ('writing'), e.g. 'This is my shopping list.'

126 Y
recognises own name (or part of it) in print, e.g. 'My name starts with that.'

127 B
attempts to write own name

128 B
thinks own marks on paper ('writing') can be read by others

129 Y
enjoys stories and asks for them to be retold or reread

130 Y
listens attentively to the telling or reading of stories and other texts

131 B
makes marks on paper ('writes') spontaneously for self rather than for an audience

132 Y
understands that writing and drawing are different, e.g. points to text while 'reading'

2. Experimental Phase

201 B
reads back own writing

202 Y
orally retells events in sequence

203 Y
orally recounts own experiences

204 B
voices thoughts while writing

205 B
experiments with familiar forms of writing, e.g. lists, letters

206 Y
writes to communicate messages, direct experiences or feelings

207 B
makes no attempt to orient the reader as it is assumed that writer and reader share the context

208 B
writes using simplified or all language structure, e.g. I brt loles

209 B
often begins sentence with 'I'

210 B
repeats familiar words when writing, e.g. cat, cat, cat

211 B
generates writing by repeating the same beginning patterns, e.g. 'I like cats, I like dogs, I like birds ... '

212 B
recognises some words and letters in context

213 Y
realises that print contains a constant message

214 Y
tells others what has been written

25 B
asks others what has been written

216 B
uses upper and lower case letters unconventionally when writing

217 B
traces and copies letters with some successful formations

218 Y
uses left to right, and top to bottom, orientation of print

219 Y
organises print direction left to right

220 Y
organises print direction top to bottom

221 Y
distinguishes between numerals and letters

222 Y
demonstrates one to one correspondence between written and spoken word

223 B
leaves a space between word-like clusters of letters

224 Y
dictates slowly so teacher can 'keep up' while scribing

225 B
points to 'words' while reading own writing

226 B
voices thoughts while reading

227 Y
reads back what has been written to clarify meaning

228 B
experiments with, and over-generalises, print conventions, e.g. puts a full stop after each word

229 B
relies heavily on the most obvious sounds of a word

230 B
uses knowledge of rhyme to spell words written

231 Y
listens attentively to the telling or reading of stories and other texts

232 Y
writes spontaneously for self or chosen audience

233 Y
uses writing to convey meaning

3. Early Writing Phase

301 B
uses a small range of familiar text forms

302 B
uses a partial organisational framework, e.g. simple orientation and story development

303 B
often writes simple recount of personal events or observation and comment

304 Y
uses time order to sequence and organise writing

305 B
is beginning to use some narrative structure

306 B
is beginning to use some informational text structures, e.g. recipes, factual description

307 B
includes irrelevant detail in 'dawn to dark' recounts

308 B
attempts to orient, or create a context for the reader, but often assumes a shared context

309 Y
rewrites known stories in sequence

310 Y
includes detail in written retell

311 B
is beginning to use 'book' language, e.g. 'By the fire sat a cat.'

312 B
attempts to transfer knowledge of text structure to writing, e.g. imitates form of a familiar big book

313 Y
has difficulty staying on topic

314 B
is beginning to use written language structures. Has a sense of sentence, ie. writes complete sentences with or without punctuation.

315 B
writes in a style that resembles oral language

316 Y
includes some dialogue

317 Y
uses little variety in sentence length

318 B
joins simple sentences (often over using the same connectors, e.g. 'and', 'then')

319 B
includes little elaboration, usually simple description

320 Y
uses knowledge of rhyme, rhythm and repetition in writing

321 B
repeats familiar patterns, e.g. 'In the jungle I saw ...'

322 B
writes a range of words that are personally significant

323 Y
discusses word formations and meanings; noticing similarities and differences

324 Y
transfers words encountered in talk, or reading, to writing

325 B
highlights words for emphasis, e.g. BIG

326 B
begins to develop editing skills

327 Y
when editing deletes words to clarify meaning

328 Y
when editing adds words to clarify meaning

329 B
when editing begins to proof-read for spelling errors

330 Y
when editing adds information on request

331 B
attempts to use some punctuation

332 B
sometimes uses full stops

333 B
sometimes uses a capital letter to start a sentence

334 B
uses capital letters for names

335 B
attempts use of question marks

336 B
attempts use of exclamation marks

337 B
sometimes uses apostrophes for contractions

338 B
over generalises use of print conventions, e.g. overuse of apostrophes

339 B
often writes in the first person

340 Y
attempts writing in both first and third person

341 B
usually uses appropriate subject/verb agreements

342 B
usually uses appropriate noun/pronoun agreements

343 B
usually maintains consistent tense

344 Y
writes a title which reflects content

345 Y
perseveres to complete writing tasks

346 Y
resents interruption

347 Y
is preoccupied with a desire to get everything right

348 B
has difficulty writing because of the complexity of the task, e.g. attending to spelling, handwriting, composing, punctuation simultaneously

349 Y
re-reads own writing to maintain word sequence

4. Conventional Phase

401 B
uses text forms to suit purpose and audience (may not control all essential elements, e.g. may use narrative language when writing informational text)

402 Y
uses rhyme, rhythm and repetition for effect (where appropriate)

403 Y
writes using a variety of forms

404 Y
demonstrates the ability to develop a topic

405 Y
demonstrates knowledge of differences between narrative and informational text when writing

406 Y
shows evidence of planning before writing (may be oral or written plan)

407 Y
organises the structure of writing more effectively, e.g. uses headings, sub-headings

408 Y
can write from another's point of view

409 Y
shows evidence of personal voice (where appropriate)

410 Y
considers the needs of audience and includes background information

411 Y
can transfer information from reading to writing, e.g takes notes for project

412 Y
uses simple, compound and extended sentences

413 Y
often includes dialogue

414 Y
uses dialogue to enhance character development

415 Y
show evidence of the transfer of literary language from reading to writing

416 Y
writes a topic sentence and includes relevant information to develop a cohesive paragraph

417 Y
groups sentences containing related information into paragraphs

418 Y
orders ideas in time order or other sequence such as priority order

419 Y
links ideas coherently in whole texts

420 Y
uses a variety of connectors such as and, so, because, if, next, after, before, first...

421 B
is beginning to select vocabulary according to the demands of audience and purpose, e.g. uses subject specific vocabulary

422 B
uses some similes or metaphors in an attempt to enhance meaning

423 B
uses words that adequately convey meaning but lack variety

424 Y
varies vocabulary for interest

425 Y
includes specific vocabulary to explain or describe, e.g. appropriate adjectives

426 B
provides sufficient information but little elaboration

427 Y
uses adverbs and adjectives to enhance meaning

428 B
uses simple colloquialisms and cliches

429 Y
edits and proof-reads own writing after composing

430 Y
when editing re-orders text to clarify meaning, e.g. moves words, phrases and clauses

431 Y
when editing re-orders words to clarify meaning

432 B
when editing attempts to correct punctuation

433 B
when editing recognises most misspelled words and attempts corrections

434 Y
punctuates simple sentences correctly

435 Y
uses capital letters for proper nouns

436 Y
uses capital letters to start sentences

437 Y
uses capital letters for titles

438 Y
uses full stops to end sentences

439 Y
uses question marks correctly

440 B
sometimes uses commas

441 Y
uses apostrophes for possession

442 Y
writes apostrophes for contractions

443 Y
writes effectively in both first and third person

444 Y
uses appropriate subject/verb agreements

445 Y
uses appropriate noun/pronoun agreements

446 Y
maintains appropriate tense

447 Y
use titles and headings appropriately

448 Y
writes for enjoyment

449 Y
writes to get things done

450 Y
experiments with calligraphy, graphics and different formats

451 Y
manipulates language for fun, e.g. puns, symbolic character or place names (Ms Chalk, the teacher, Pitsville)

452 Y
re-reads and revises while composing

5. Advanced Phase

501 Y
selects form to suit purpose and audience demonstrating control over essential elements.

502 Y
demonstrates success in writing a wide range of forms

503 Y
uses personal voice effectively (where appropriate)

504 Y
has sufficient information to fulfil demands of writing tasks

505 Y
has sufficient quality ideas to fulfil the demands of writing tasks

506 Y
develops topic fully

507 Y
uses plan to organise ideas

508 Y
uses appropriate organising features such as headings

509 Y
sustains coherence and cohesion throughout text

510 Y
demonstrates ability to view writing from a reader's perspective

511 Y
writes a complete, succinct orientation

512 Y
establishes place, time and situation in writing

513 Y
consciously varies writing to suit audience needs

514 Y
uses a variety of simple, compound and complex sentences appropriate to text form

515 Y
deliberately chooses syntactic patterns to enhance the text and varies these according to audience and purpose

516 Y
uses complex sentences with embedded clauses or phrases, e.g. 'My friend Jane, who lives next door,...'

517 Y
understands and uses appropriate connectors

518 Y
signals cause and effect using - if, then, because, so since, result in, brings about

519 Y
signals comparisons using - like, different from, however, resembles, whereas, similar

520 Y
signals alternatives using - on the other hand, otherwise, conversely, either, instead (of), whether

521 Y
signals time order using - later, meanwhile, subsequently, initially, finally

522 Y
uses a wide range of words that clearly and precisely convey meaning in a particular form

523 Y
selects words, clauses or phrases for their shades of meaning and impact on style

524 Y
orders words for effect

525 Y
elaborates ideas to convey coherent meaning

526 Y
sustains appropriate language throughout, e.g. formal language in a business letter

527 Y
uses abstract and technical terms in context

528 Y
uses humour, sarcasm or irony

529 Y
uses idioms and colloquialisms to enhance writing

530 Y
attempts to involve reader by the use of metaphor, simile, imagery and other literary devices that require commitment from the reader

531 Y
edits own writing independently during and after composing

532 Y
when editing restructures words, phrases, clauses, paragraphs and whole texts to clarify and achieve precise meaning

533 2
demonstrates accurate use of punctuation

534 Y
demonstrates accurate use of:
- capital letters
- full stops
- commas for a variety of purposes
- quotation marks
- exclamation marks
- apostrophes for contractions
- apostrophes for ownership
- paragraphing
- brackets and dashes

535 Y
ealises that punctuation can be used to alter meaning

536 Y
uses punctuation to enhance meaning

537 Y
writes for enjoyment, to get things done and for personal expression

538 Y
shows interest in the craft of writing

539 Y
is motivated to write by a desire to complete school imposed tasks that fulfil curriculum requirements

540 Y
reflects on, and critically evaluates, own writing

APPENDIX B:

Estimates of the difficulty of the indicators from the First Steps Spelling and Writing Continua.

The measure of difficulty of an indicator was estimated using Rasch modelling. This technique requires that those indicators for which either all or none of the students demonstrated a competency are removed from the analysis. Consequently not all indicators appear in the lists below. The estimate of difficulty of the indicators is measured by using the natural log odds of the proportion of students who were identified as having not demonstrated competency on the indicator.

Each continuum has a list of estimates ordered by the indicator code number and a list ordered by the estimated difficulty of the indicator.

A note on the indicator codes:

The indicator codes have 3 digits. They are the same as those used in Appendix A. The response set codes 'B' and 'Y', used in Appendix A are not used here. Appendix A will need to be used to link the scores shown in this Appendix back to the indicators as they appear in First Steps publications.

For both the Spelling and Writing continua the code numbers are ordered so that the first digit identifies the phase and the second and third digits identify the indicator. They follow the sequence used in First Steps publications. The phase code numbers are also in the order used by First Steps and so reflect the sequence that they have in the continua. So, in the Spelling continuum the first digit of the code number means the following:

1 = Preliminary Phase
2 = Semi-phonetic Phase
3 = Phonetic Phase
4 = Transitional Phase
5 = Advanced Phase

An example to help. The code number '101' means 'Preliminary Phase' indicator '01', which is, "The child draws symbols that resemble letters using straight, curved, intersecting lines." For ease of use these codes are also placed at the head of the list in which the Spelling indicators are ordered by difficulty.

The codes for the Writing continuum indicators are given at the start of the listings for this continuum.

Spelling Indicators

1. Indicators ordered by indicator code number.

Spelling Indicator Code	Difficulty Measure
101	-2.54
102	-0.58
103	-0.20
104	-0.20
105	-1.19
106	-1.52
109	-3.74
110	-3.74
113	-3.74
114	0.48
115	-3.74
116	-0.03
117	-2.54
118	-1.94
119	-1.67
120	0.30
121	-1.05
122	-2.20
123	-1.52
124	-1.71
201	-3.74
202	-0.06
203	0.57
204	0.02
205	1.46
206	-0.24
207	1.34
208	1.52
209	0.07
210	-0.58
211	-1.71
212	-2.54
213	-1.94
214	-1.35
215	-0.48
216	1.02
217	-0.06
218	0.14
219	-2.54
220	-1.67
221	-0.92
301	0.49
302	0.69
303	0.38
304	1.66
305	0.36
306	0.58
307	1.53
308	1.06
309	-0.42
310	-0.89
311	1.13
312	-1.55
313	-0.47

Spelling Indicator Code	Difficulty Measure
314	-0.20
315	0.54
316	-0.86
317	1.35
318	-0.09
319	0.04
320	0.75
321	1.18
322	-0.98
323	0.98
401	-1.08
402	1.12
403	1.82
404	-0.46
405	-0.05
406	1.25
407	0.44
408	0.28
409	0.08
410	0.49
411	1.60
412	0.01
413	-1.47
414	0.52
415	2.47
416	0.67
417	-0.16
418	0.28
419	1.18
420	1.11
501	1.09
502	1.50
503	1.57
504	1.31
505	-2.21
506	1.80
507	3.38
508	1.93
509	1.14
510	2.33
511	2.04
512	1.00
513	0.99
514	-0.13
515	2.10
516	2.57
517	1.03
518	1.38
519	1.53
520	1.06

2. Spelling Indicators ordered by the estimated difficulty of the indicator.

The first digit in the code number for the Spelling continua means:
1 = Preliminary Phase
2 = Semi-phonetic Phase
3 = Phonetic Phase
4 = Transitional Phase
5 = Independent Phase

Spelling Indicator Code	Difficulty Measure
507	3.38
516	2.57
415	2.47
510	2.33
515	2.10
511	2.04
508	1.93
403	1.82
506	1.80
304	1.66
411	1.60
503	1.57
519	1.53
307	1.53
208	1.52
502	1.50
205	1.46
518	1.38
317	1.35
207	1.34
504	1.31
406	1.25
321	1.18
419	1.18
509	1.14
311	1.13
402	1.12
420	1.11
501	1.09
520	1.06
308	1.06
517	1.03
216	1.02
512	1.00
513	0.99
323	0.98
320	0.75
302	0.69
416	0.67
306	0.58
203	0.57
315	0.54
414	0.52
301	0.49
410	0.49
114	0.48
407	0.44
303	0.38

Spelling Indicator Code	Difficulty Measure
305	0.36
120	0.30
418	0.28
408	0.28
218	0.14
409	0.08
209	0.07
319	0.04
204	0.02
412	0.01
116	-0.03
405	-0.05
217	-0.06
202	-0.06
318	-0.09
514	-0.13
417	-0.16
103	-0.20
104	-0.20
314	-0.20
206	-0.24
309	-0.42
404	-0.46
313	-0.47
215	-0.48
210	-0.58
102	-0.58
316	-0.86
310	-0.89
221	-0.92
322	-0.98
121	-1.05
401	-1.08
105	-1.19
214	-1.35
413	-1.47
106	-1.52
123	-1.52
312	-1.55
220	-1.67
119	-1.67
124	-1.71
211	-1.71
213	-1.94
118	-1.94
122	-2.20
505	-2.21
219	-2.54
101	-2.54
212	-2.54
117	-2.54
115	-3.74
113	-3.74
201	-3.74
110	-3.74
109	-3.74

Writing Continuum

The first digit of the code number for the Writing continuum means the following:

1 = Role Play Phase
2 = Experimental Writing Phase
3 = Early Writing Phase
4 = Conventional Phase
5 = Advanced Phase

3. Indicators ordered by indicator code number.

Writing Indicator Code	Difficulty Measure
101	-2.3
102	-3.87
104	-0.94
105	-1.67
106	-3.12
107	1.71
108	-3.43
109	-2.47
110	2.39
111	-2.86
112	-2.3
113	-2.47
114	-3.87
115	-1.19
116	0.36
117	-1.46
119	-0.71
120	-4.59
121	-0.79
122	-1.91
123	-4.59
124	-0.7
125	-2.65
129	-2.1
130	-2.47
131	-2.47
201	-2.47
202	-2.65
203	-4.59
204	-0.03
205	-0.09
206	-3.12
207	-1.1
08	-1.52
209	-1.02
210	-0.96
211	-1.1
212	-2.65
213	-2.65
214	-1.78
215	-0.94
216	0.23
218	-3.87

Writing Indicator Code	Difficulty Measure
219	-3.87
220	-3.87
221	-3.87
222	-2.16
223	-1.89
224	-0.86
225	-1.89
226	-0.94
227	-0.09
228	0.04
229	-1.78
230	0.17
231	-2.86
232	-0.5
233	-3.1
301	-0.87
302	-0.92
303	-1.36
304	-1.07
305	-0.77
306	-0.84
307	2.15
308	-0.45
309	-1.26
310	0.21
311	0.78
312	0
314	-2.37
315	-0.28
316	0.8
317	0.74
318	-0.5
319	-0.96
320	1.21
321	-0.38
322	-0.98
323	0.52
324	-0.52
325	1.31
326	-0.02
327	1.25
328	1.06
329	0.84
330	-0.55
331	-1.42
332	-1.27
333	-1.73
334	-1.09
335	0.2
336	1.64
337	0.25
338	2.57
339	-0.7
340	0.42
341	-1.4
342	-2.61
343	-1.43
344	-0.2

Writing Indicator Code	Difficulty Measure
345	-0.55
346	2.25
347	2.52
348	0.96
349	-0.11
401	-0.66
402	1.92
403	0.04
404	0.34
405	-0.73
406	0.73
407	1.45
408	1.19
409	1.14
410	1.56
411	0.58
412	1.15
413	1.27
414	1.33
415	1.42
416	1.97
417	1.87
418	-0.57
419	0.44
420	0.46
421	0.48
422	2.33
423	-0.82
424	1.38
425	0.59
426	-1.23
427	1.15
428	2.55
429	1.01
430	3.07
431	2.49
432	0.5
433	1.07
434	-0.63
435	-0.04
436	-1.36
437	-0.91
438	-1.22
439	0.18
440	0.04
441	1.87
442	0.06
443	0.88
444	-0.76
445	-1.17
446	-0.06
447	0.28
448	1.01
450	1.6
449	0.87
451	2.81
452	1.8
501	1.89

Writing Indicator Code	Difficulty Measure
502	0.01
503	2.37
504	-0.02
505	0.98
506	2.62
507	1.69
508	-0.36
509	1.44
510	2.31
511	2.63
512	0.09
513	2.62
514	1.81
515	4.11
516	2.62
517	-0.17
518	-0.22
519	1.92
520	3.62
521	1.56
522	2.0
523	4.1
524	2.06
525	1.87
526	1.56
527	4.02
528	2.62
529	4.1
530	4.1
531	2.43
532	3.34
533	0.63
534	1.56
536	0.48
537	0.09
538	1.46
539	0.48
540	2.8

4. Writing continuum Indicators ordered by difficulty measure.

The first digit of the code number for the Writing continuum means the following:

1 = Role Play Phase
2 = Experimental Writing Phase
3 = Early Writing Phase
4 = Conventional Phase
5 = Advanced Phase

Writing Indicator Code	Difficulty Measure
515	4.11
530	4.1
529	4.1
523	4.1
527	4.02
520	3.62
532	3.34
430	3.07
451	2.81
540	2.8
511	2.63
528	2.62
516	2.62
513	2.62
506	2.62
338	2.57
428	2.55
347	2.52
431	2.49
531	2.43
110	2.39
503	2.37
422	2.33
510	2.31
346	2.25
307	2.15
524	2.06
522	2.0
416	1.97
519	1.92
402	1.92
501	1.89
525	1.87
441	1.87
417	1.87
514	1.81
452	1.8
107	1.71
507	1.69
336	1.64
450	1.6
534	1.56
526	1.56
521	1.56

Writing Indicator Code	Difficulty Measure
410	1.56
538	1.46
407	1.45
509	1.44
415	1.42
424	1.38
414	1.33
325	1.31
413	1.27
327	1.25
320	1.21
408	1.19
427	1.15
412	1.15
409	1.14
433	1.07
328	1.06
448	1.01
429	1.01
505	0.98
348	0.96
443	0.88
449	0.87
329	0.84
316	0.8
311	0.78
317	0.74
406	0.73
535	0.63
425	0.59
411	0.58
323	0.52
432	0.5
539	0.48
536	0.48
421	0.48
420	0.46
419	0.44
340	0.42
116	0.36
404	0.34
447	0.28
337	0.25
216	0.23
310	0.21
335	0.2
439	0.18
230	0.17
537	0.09
512	0.09
442	0.06
440	0.04
403	0.04
228	0.04
502	0.01
312	0
504	-0.02
326	-0.02

Writing Indicator Code	Difficulty Measure
204	-0.03
435	-0.04
446	-0.06
227	-0.09
205	-0.09
349	-0.11
517	-0.17
344	-0.2
518	-0.22
315	-0.28
508	-0.36
321	-0.38
308	-0.45
318	-0.5
232	-0.5
324	-0.52
345	-0.55
330	-0.55
418	-0.57
434	-0.63
401	-0.66
339	-0.7
124	-0.7
119	-0.71
405	-0.73
444	-0.76
305	-0.77
121	-0.79
423	-0.82
306	-0.84
224	-0.86
301	-0.87
437	-0.91
302	-0.92
226	-0.94
215	-0.94
104	-0.94
319	-0.96
210	-0.96
322	-0.98
209	-1.02
304	-1.07
334	-1.09
211	-1.1
207	-1.1
445	-1.17
115	-1.19
438	-1.22
426	-1.23
309	-1.26
332	-1.27
436	-1.36
303	-1.36
341	-1.4
331	-1.42
343	-1.43
117	-1.46
208	-1.52

Writing Indicator Code	Difficulty Measure
105	-1.67
333	-1.73
229	-1.78
214	-1.78
225	-1.89
223	-1.89
122	-1.91
129	-2.1
222	-2.16
112	-2.3
101	-2.3
314	-2.37
201	-2.47
131	-2.47
130	-2.47
113	-2.47
109	-2.47
342	-2.61
213	-2.65
212	-2.65
202	-2.65
125	-2.65
231	-2.86
111	-2.86
233	-3.1
206	-3.12
106	-3.12
108	-3.43
221	-3.87
220	-3.87
219	-3.87
218	-3.87
114	-3.87
102	-3.87
203	-4.59
123	-4.59
120	-4.59

APPENDIX C:

List of those indicators from the First Steps Spelling and Writing continua not understood by some Year 1, 3, 5 or 7 classroom teachers.

This appendix list the indicators which were not understood by one or more teachers. The indicators are identified by code numbers. See Appendix A to link the code numbers to the indicators.

Spelling Continua

Indicator Code	Number of Teachers not Understanding
120	1
315	1
319	1
406	1
411	1
418	2
512	1
515	1
516	1
517	1

Writing Continua

Indicator Code	Number of Teachers not Understanding
210	1
302	1
307	2
308	1
315	2
317	2
321	1
320	1
322	3
339	1
342	2
401	2
409	3
415	2
423	1
445	1
449	9
501	1
503	1
504	1
511	2
515	1
519	1
524	2
531	1

APPENDIX D:

Questions from the Year 1 and Year 5 classroom teachers' questionnaires concerning the First Steps continua.

This appendix lists those questions asked of Year 1 and year 5 classroom teachers about the First Steps continua. Other questions were asked of the teachers but only those questions that provided data for this report are shown here.

Q12. During any time in 1992 have you used with the Year 1 students in this class, however briefly, any of the following First Steps Continua?
(Tick as many boxes as apply)

- **Writing Development Continuum** ☐
- **Writing Learning Continuum** ☐
- **Spelling Development Continuum** ☐
- **Reading Development Continuum** ☐
- **Oral Language Development Continuum** ☐

Q14. How well do the continua which you have used with this Year 1 class in 1992 depict the development which you see in your students?

(Note that where these questions were answered by Year 5 teachers, the words 'Year 1' were replaced by the words 'Year 5' in the questionnaire.)

TM028165

U.S. DEPARTMENT OF EDUCATION

EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

REPRODUCTION RELEASE

I. DOCUMENT IDENTIFICATION

Title: Empirical Validation of the First Steps Spelling and Writing Continua
Author(s): Australian Council for Educational Research (ACER)
Date: March 1993

II. REPRODUCTION RELEASE

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, Resources in Education (RIE), are usually made available to users in microfiche, reproduced paper copy, or electronic/optical media, and are sold through the ERIC Document Reproduction Service (EDRS) or other ERIC vendors. Credit is given to the source of each document. If reproduction release is granted, one of the following notices is affixed to the document.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY _____ _____ TO THE EDUCATION RESOURCES INFORMATION CENTER (ERIC)"	"PERMISSION TO REPRODUCE THIS MATERIAL IN OTHER THAN PAPER COPY HAS BEEN GRANTED BY _____ _____ TO THE EDUCATION RESOURCES INFORMATION CENTER (ERIC)"

If permission is granted to reproduce the identified document, please CHECK ONE of the options below and sign the release on the other side.

☑ Permitting microfiche (4" x 6" film), paper copy, electronic, and optical media reproduction (Level 1).

OR

☐ Permitting reproduction in other than paper copy (Level 2).

Documents will be processed as indicated, provided quality permits. If permission to reproduce is granted, but neither box is checked, documents will be processed at Level 1.

Signature Required

"I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce this document as indicated on the other side. Reproduction from the ERIC microfiche or electronic/optical media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquires."

Signature: Dennis Jackson
Printed Name: Dennis Jackson
Organization: Heinemann
Position: Manager, *First Steps*™ USA
Address: 361 Hanover Street, Portsmouth, New Hampshire
Tel. No: 603.431.7894 Zip Code: 03801

III. DOCUMENT AVAILABILITY INFORMATION

(Non-ERIC Source)

If permission to reproduce is not granted to ERIC, or, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents which cannot be made available through EDRS).

Publisher/Distributor: N/A
Address:
Price Per Copy:
Quantity Price:

IV. REFERRAL TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER

If the right to grant reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Education Department of Western Australia
First Steps Consultancy Unit
469 Wellington Street
Perth 6000
Western Australia